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ANATOMICAL,  
PATHOLOGICAL AND THERAPEUTIC  
RESEARCHES  
ON THE YELLOW FEVER OF GIBRALTAR

OF 1828;

BY P. CH. A. LOUIS,

Physician to the Hotel Dieu; President for Life of the Society for Medical Observation  
of Paris; Member of the Royal Academy of Medicine of Paris; Honorary  
Member of the Massachusetts Medical Society,  
&c. &c. &c.

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FROM OBSERVATIONS  
TAKEN BY HIMSELF AND M. TROUSSEAU,

AS MEMBERS OF THE FRENCH COMMISSION AT GIBRALTAR.

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TRANSLATED FROM THE MANUSCRIPT

BY G. C. SHATTUCK, JR. M. D.

Member of the Society for Medical Observation at Paris; Fellow of the Massachusetts Medical Society.

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BOSTON,  
CHARLES C. LITTLE AND JAMES BROWN.

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## TRANSLATOR'S INTRODUCTION.

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THE work now presented to the public has heretofore existed in manuscript only. Circumstances have delayed its publication in France, and some years may yet elapse before it appears in that country. Convinced of its utility and importance, and believing that it would be appreciated by English readers, I proposed to M. Louis to translate and publish it in America. He acceded to the proposition and placed his manuscript in my hands. It has been my endeavor to be a faithful translator and editor.

It is only by a diligent study of the works of M. Louis that any one can become acquainted with his peculiarities as a medical philosopher and writer. His most important works have been translated and published in this country, the attention of the medical profession has been called to them, and there

can be few educated persons, not of the profession, to whom his name is not familiar. And yet, do not many considerations urged by those, who, pretending to know, place comparatively little value on the labors and results of this author, proceed from an imperfect acquaintance with him and a misapprehension of the objects which he endeavors to accomplish? Some seem to have been misled by the term numerical system, which has been said to be that of M. Louis. They seem to have thought that his peculiarity consists in this merely, that he counts. And yet we find all authors speaking of such a symptom as frequent or rare, of the per-centage of mortality. We call some men experienced, scientific. Is it not by comparing individual cases, by adding what they have observed in one to what they have observed in another, by *counting*, that they have become so? But there are different ways of counting. Whilst many have counted and do count imperfectly, vaguely, from impressions, memory, M. Louis confines himself to facts, and deals in exact terms. He is peculiar for the care with which he takes the observations from which he counts. We know of him that he often spends hours examining and questioning a single patient, recording at the bedside the results of his observation, and then devoting hours more to anatomical investigations, examining and describing the state of every organ

in the body. We know of him that, at the age of thirty-three, he abandoned the successful practice of his profession, consecrated the seven following years to observation exclusively, then made a strict and careful analysis of his facts and published the results. In this he must be allowed to have been peculiar. He thus practically manifested his belief in that passage from Rousseau, which he has prefixed as a motto to his Typhoid Fever: "I know that the truth is in the facts and not in the mind which observes them." But, say some objectors, do we not find in the works of all medical authors, from Hippocrates to those of the present day, that medicine is a science of observation? Does any one pretend to deny what M. Louis so loudly proclaims? No one—and yet how many are there, are there any, who have uniformly acted accordingly? When Cullen announced that an atony subsisting in the extreme vessels on the surface of the body, *ascertained as a matter of fact*, may be considered as a principal circumstance in the proximate cause of fever, did he or did he not swerve from the truth acknowledged by himself, that medicine is a science of observation? What must we say of Brown, when we read in his works that the cause of contagious typhus, of plague, as of diseases not febrile, is debility? And when Broussais tells us that yellow fever is a gastro-enteritis, and that the yellowness in this disease

depends on inflammation of the small intestine, does he tell us what exists, what he has observed, or only what he has imagined? And do we not find similar reasoning, propositions of the same kind, in a great part of the numerous works which have been published within the last few years?

Our author, then, is remarkable as a laborious and careful observer; he insists on the importance and difficulty of observation, as no one before him has done, must he not, and with the same propriety, be considered a strict and conscientious reasoner? That intense love of truth which directs his labors at the bedside and in the autopsy room, goes with him when he sits down to analyse facts, and thus to deduce general laws. The memory is uncertain and treacherous, unable to cope with numerous details, he never depends on it. The imagination is active and ready to say what may be, from his analysis there can result only what *is*. His conclusions, laws, are the expression of facts. Thus he gives us five cases of yellow fever in which no appreciable alteration of the mucous membrane of the stomach was found, and then says that the yellow fever of Gibraltar of 1828, is not a gastritis. Can the truth of this conclusion be questioned now or at any subsequent period? Can it ever be falsified?

Some have been disposed to maintain that the ob-

jects of M. Louis are chimerical. They speak of the difficulties of medical investigations, of the numerous details and circumstances, that all can never be seized or appreciated. No one can insist more strongly on these difficulties than M. Louis himself. In his clinical instructions, he continually calls the attention of his pupils to them. But he finds in them reasons for effort and hope, not for inaction and despair. He admits that observation is imperfect, and for that very reason he strives to improve it. He warns the student that vital phenomena are incumbered with innumerable circumstances and details, but he urges him to be unremitting in his efforts to seize them. Perfect mathematical exactness is not yet attained in medicine, it may be unattainable. M. Louis thinks that we can reach a higher degree of accuracy and precision than that we now have. In the present state of science, we must often be content with probability. M. Louis acknowledges this, whilst he insists that there is a great difference between the probable and the true, for the probable may be false.

There are those who object to the numerous observations scattered through the works of M. Louis, that they are so full of details as to be tedious. But are they not indispensable? In these *detailed* observations we have the means of ascertaining whether the conclusions and opinions of the author



be true. Authority is done away with, and how far that has been injurious in medical science, no one at all conversant with the history of medicine need be told.

But it is not my intention to incumber this work with a discussion of the system or the merits of M. Louis. Much has been said and written on observation and the numerical system, perhaps more than is necessary. The lover of truth must examine the subject for himself. To such this volume is commended with the hope that it will be found interesting as a scientific work, and useful for the light it may shed on the disease of which it treats.

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## AUTHOR'S INTRODUCTION.

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THE epidemic yellow fever which prevailed in Gibraltar, in 1828, commenced in the middle of the month of August, towards the close of a summer which does not appear to have been remarkable for its temperature, and terminated the 25th of the following December, after a violent hurricane ; that is to say, no new case of the disease was authentically ascertained after that time.

The French government, desirous of information on the origin and mode of propagation of this new epidemic of yellow fever, appointed a commission of physicians, composed of Drs. Chervin, Trousseau, and myself, who should go to Gibraltar, and collect such facts as might lead to the solution of the problem.

The commission left Paris the first of November, and arrived in Gibraltar the 23d of the same month, thirty-three days before the termination of the epidemic.

Before collecting the documents which were to throw light on the origin and propagation of the disease, it was first to be ascertained whether the disease was really the yellow fever; observations were to be taken, and as many autopsies to be made as circumstances and the advanced period of the epidemic permitted.

The commission commenced their labors the day after that on which they arrived in Gibraltar; the autopsies were nearly all made in the presence of the three physicians, and M. Trousseau and myself, held alternately the pen and the scalpel. The symptoms of the disease were noted by him or by myself, rarely by both of us, and several of our professional brethren assisted us in this part of our labors, of whom I mention particularly Mr. Fraser, surgeon of the Civil Hospital, and Messrs. Gillkrest, Amiel and Smith, surgeons of the English forces, who kindly consented to be our interpreters. M. Chervin also, sometimes acted for us in this capacity.

In the midst of universal desolation, our observations were taken with great care. We had time enough, and our professional brethren afforded us every facility for a thorough examination of the bodies, being themselves present at the autopsies. And we, that is, M. Trousseau and myself, were fully aware of the importance of a study of the

pathology of the disease, even supposing the necessary information on the origin and mode of propagation of the epidemic to be obtained in the documents collected by the commission. We felt that, independently of the task which our government had imposed on us, we owed it to our profession, to study the disease before us, and this too, more carefully, if not more minutely, than we should have studied an ordinary malady. The sporadic diseases of our climate may be studied at all times, and we can ascertain almost any day, whether the descriptions of them by authors be exact and correct. It is not so with an epidemic. The description of it must remain as it was made at the time of its prevalence. We can add nothing to it, we can take nothing from it, we cannot assure ourselves by observation, of the fidelity and ability of its observers. Two epidemics of the same disease differ more or less from each other. How very important then, becomes the careful observation of an epidemic !

Fully aware of all this, M. Trousseau and myself began our labors together. Our observations were made in common, for we believed that in this way they would be more complete and exact, and that besides there could spring up between us no opposition or rivalry, which might bring upon science an injury from a journey, undertaken purely with a

view of benefiting it. The study and analysis of the facts, could not be a joint production, as every one must be aware. I assumed this task, and devoted myself to it immediately on my return to Paris, so that the work now presented to the public has been completed nine years. M. Trousseau undertook to analyse the documents collected by the commission in relation to the origin and mode of propagation of the yellow fever of Gibraltar,\* and to ascertain if any rigorous conclusions could be drawn in favor of contagion or of infection, those two modes of propagation of the disease, which still divide medical opinion.

Circumstances have prevented M. Trousseau from completing this undertaking, nor have I been able to engage in it, so that the analysis which would naturally occupy a chapter in this work, is necessarily postponed.

Happily our ignorance of the causes of many diseases does not destroy our interest in the study of their pathology. We must study symptoms, the history, the termination, the duration, the treatment, and many other circumstances unconnected with etiology; and were we sure of the etiology of yel-

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\* These documents were printed in 1830, and copies of them may be had of the bookseller, M. Baillière.

low fever, it would be no less necessary to study the disease. These considerations have induced me to delay no longer the publication of this work, and as I am to treat of the epidemic yellow fever which prevailed in Gibraltar in 1828, independently of its causes and its mode of propagation, I have followed the plan which I have before pursued in similar works. I commence by giving in a first part a few detailed observations, hoping thus to give the reader a more or less definite idea of the disease, and at the same time prepare his mind for a consideration of the important facts, as the analysis shews them in their due succession.

In the second part of my work, I examine my facts anatomically, I compare my anatomical descriptions with those of other acute diseases, and I am thus led naturally to the knowledge of the anatomical characters of the disease. In a second chapter I ask, how far is death in the fatal cases explained by the condition of the organs.

In a third part, I study the symptoms, in order to ascertain their value. I compare them with those which have been noted by our professional brethren in observations communicated to us, and in as many separate chapters, I compare the mortality, the severity, the character of the affection, at the commencement, at the termination and at different

periods of the epidemic. I study the diagnostic symptoms of the disease, and I seek an answer to the question. Does a first attack of yellow fever preserve from a second?

In the fourth part, I consider the different modes of treatment adopted by the military and civil medical men who were practising at Gibraltar at the time of the last epidemic, and I have pointed out some modifications of their plans, which I have thought might be advantageously adopted by any who may be called upon to act in similar circumstances.

Several of our professional brethren, amongst others Mr. Amiel, surgeon of the twelfth regiment, and Mr. Fraser, surgeon of the Civil Hospital of Gibraltar, had often spoken to us of what they believed to be sporadic cases of yellow fever, which came under their observation in the intervals between epidemics. We begged them to communicate to us all such cases, and an analysis of these observations forms the last part of my work.

And I would here beg the reader to remember that this work is not a treatise on yellow fever, but a history of the epidemic yellow fever which prevailed in Gibraltar in 1828. All the general facts which result from my analysis, may not be found in other epidemics, yet probably the points of resemblance



will be so numerous, that the usefulness of my researches will not be questioned, and that I shall have no reason to regret having undertaken them.\*

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\* M. Rufz, a distinguished observer, and for some years established at Martinique, as a physician, has recently informed M. Louis, by letter, that the lesion of the liver which forms the anatomical character of the yellow fever of Gibraltar of 1828, has been found by him in the cases of yellow fever which he has observed at Martinique, and that this is the only constant and uniform lesion.

Dr. Putnam has kindly communicated to me his notes of an autopsy, made by him at Boston, in 1835. The subject was believed to have died of yellow fever, and the condition of the liver seems to have been identical with that observed by M. Louis in the victims of the yellow fever of Gibraltar of 1828.—[*Tr.*]

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I shall give successively my observations in this First Part, and I shall add to them such remarks as appear to me necessary to a perfect comprehension of the symptoms, their progress, of the lesions, and of the relation of the lesions to the symptoms.



## PART I.

### OBSERVATIONS.

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#### FIRST OBSERVATION.

JOHN FELL, soldier of the forty-third regiment, æt. 24, was brought to the Northern Hospital on the evening of the 28th of November, his illness already of some hours duration. Of middle height, a strong constitution, at Gibraltar during the last seven months, and in Portugal during the preceding sixteen months, he had been in camp on the neutral plains since the 17th September, and had mounted guard at the gates without going into the city. His illness commenced without premonitory symptoms, with chills, shivering, which lasted a half hour, and were followed by heat, perspiration, giddiness, intense thirst. No nausea, no vomiting; no pain, either in the epigastrium, or in other parts of the body; the weakness moderate.

The 29th, at two o'clock, P. M., Mr. Gilchrest, the surgeon of the forty-third regiment, visited the patient for the second time, and found him as at his first visit at seven o'clock in the morning. We found the countenance natural, the answers to our questions exact, and given without hesitation, the hearing acute, no ringing in the ears, the eyes suffused and injected, the weakness moderate, giddiness supervening especially when the patient sat up; the edges of the tongue slightly red, its central part villous, greenish and brownish, very moist; thirst moderate; deglutition easy; slight pain of epigastrium on pressure; form of abdomen natural; four yellowish green stools that morning; urine passed easily, without burning sensation; skin slightly injected; heat moderate, not dry; pulse seventy, regular, moderately large, compressible.

At seven o'clock in the morning the patient had taken an ounce and a half of castor oil, and an oil enema; six leeches had been applied to his temples. Three grains of calomel every three hours were prescribed, and eighteen leeches ordered to be applied to the temples.

The patient was restless during the night, and the thirtieth, the tongue was universally moist, its edges red, its central part villous and whitish. He suffered from nausea, and vomited; pulse eighty; severe headache, considerable weakness. A bleeding of

sixteen ounces, an application of eighteen leeches to the temples, five ounces of an effervescent draught, followed by four grains of calomel, were prescribed.

The patient complained a good deal in the afternoon, and suffered from tenesmus during the evening and night. The first of December he was anxious; his breast was yellow; his pulse small and feeble; his tongue as on the day before; and he complained of a sensation of burning in the region of the xiphoid cartilage and above it.

Later in the afternoon enemata of oil had no effect; his pulse became smaller and weaker; the yellow color deeper; he vomited a greyish and brownish matter; his anxiety increased in the evening. A purgative enema and twenty-five drops of laudanum were prescribed.

The second, constant drowsiness easily dissipated, but more marked than it had been the day before. The free edges of the eyelids were of a light red color, no particular redness, no injection of the conjunctiva of the eye; pulse smaller; stertorous respiration; central part of tongue red and dry, its edges greyish; stool of a light bistre color, pultaceous. A blister applied to the epigastrium yesterday had had no appreciable effect.

The patient died the next day at four o'clock, A. M., sighing deeply, breathing with difficulty, and

delirious, but not violently so during the night. He did not vomit during the last fourteen hours of his existence.

*Autopsy six hours after death.*

EXTERIOR. — A universal yellow tint, very deep in the stripes on the back. Considerable cadaverous rigidity ; muscles perfectly natural.

HEAD. — Numerous drops of blood on the external face of the *dura mater* ; no subarachnoid infiltration ; *pia mater* very slightly injected in points, separable with difficulty from the cortical substance, which was natural. The *medullary* substance moderately dotted with blood. Both substances of a proper firmness. A half spoonful of yellowish serum in each *lateral ventricle*, two spoons full of the same liquid at base of brain. *Cerebellum* and *medulla oblongata* natural.

SPINE. — Two spoons full of clear serum in inferior part of the spinal *arachnoid*. Spinal marrow of a lighter color than is common in its whole length, in other respects natural.

NECK. — *Tonsils* large, an inch long, and proportionately wide, of a pale red color, presenting gaps, lined by a greyish, thin, soft, coating, moderately firm. *Pharynx* of a light color, its mucous membrane natural ; the top of *epiglottis*, and the *trachea*

in the interval of its *cartilaginous rings*, of the same color, otherwise natural.

CHEST. — A small spoonful of serum in each *pleural cavity*; *lungs* of proper volume, the inferior lobes of a lac red color. Neither congestion nor splenification of lungs which contained very little blood. The consistence of the right lung was nearly natural, the left lung less firm than usual. The *heart* not remarkable. Some liquid blood, and a fibrinous yellowish clot of about one line in thickness, in left ventricle. The right ventricle contained a considerable quantity of liquid blood, and a red, thin, non-fibrinous clot. The *aorta* was perfectly natural, and its walls bathed with liquid blood.

ABDOMEN. — No effusion. External condition of intestinal *canal* natural; *æsofagus* of the usual size. Vertical bands, two lines in width, some, greyish where the *epidermis* was present, others blackish and without *epidermis*. The corresponding mucous membrane in other respects perfectly natural. The *stomach* of a moderate size, contained a wine glass of a blackish, moderately thick liquid, leaving a rose tint on the walls of the vessel, which had received it, as it was turned from the vessel. Its mucous membrane was of a slight orange color, unequally so. Its middle third had a mamelonated aspect, more marked on its anterior than on its posterior face. In the great curvature were found depressions,

evident to the eye, as well as on incision of the membrane, which was only one half as thick here as in surrounding parts. Its consistence was natural, except in some points in the great curvature, where it gave on traction strips three or four lines in length. Its thickness along the great curvature was less than a line; every where else natural. The mucous membrane of the *duodenum* was universally of a red orange tint, of a proper thickness, and the strips obtained by traction in the valvular portion were from two to four lines in length. The *follicles* were not unusually developed. *Small intestine* of usual size. The *jejunum* contained a wine glass of a blackish liquid mixed with a considerable quantity of mucus. Its mucous membrane was greyish, of a proper consistence in some points, and gave by traction strips of from five to six lines. In the mucous membrane of the ileum near the cæcum, were some arborizations, and its strips were from two to three lines in length. *Peyers patches* were natural. The size of the *large intestine* was not remarkable. The cæcum, and the first half of the right colon, contained a considerable quantity of liquid blood of a raspberry color. Farther on was a thick liquid matter, of the color of light lees of wine. The mucous membrane had a pale red or livid color in some parts of the cæcum and right colon, a color of onion parings in other parts of the



first half of the large intestine, and lower down it was of a ruddy color. Its consistence was natural, somewhat diminished in the transverse colon. Its strips from six to eight lines. The submucous cellular tissue infiltrated with serum in the second half of this part of the intestine. The *liver* of a proper cohesion and firmness. Its great lobe a little pale externally, the left lobe of a light yellow color. Internally the great lobe was of an orange color, almost an olive color. The left lobe was of a greenish yellow, this color being caused by the mixture of several yellowish and greenish points, of which the last were the smallest. There were greenish points also in the great lobe, less numerous, and surrounded by small pale red orange, or yellowish points. The liver contained very little blood in its whole thickness. The *gall-bladder* extended below the sharp edge, of moderate dimensions, containing a dark green liquid, of a common viscosity ; in other respects perfectly natural. The *biliary ducts* were so also. The *kidneys* of a proper firmness, and of a light orange yellow tint. The *bladder*, the *prostate* and the *pancreas* were not remarkable.

The disease commenced in this case without precursory symptoms — shivering followed by heat, dizziness, great thirst. These symptoms continued,

and twenty-four hours after their commencement, the countenance was natural, the mind in good condition, the eyes slightly injected and suffused, the skin injected, the pulse almost natural, the epigastrium painful on pressure. The following night the patient was restless, and towards the close of the second day, his pulse was slightly accelerated; the edges of his tongue red; he had nausea, and vomited; the headache was intense; he complained of weakness. Twenty-four hours later we found him anxious; there was a sensation of burning in the epigastrium, the pulse was small and feeble. At the commencement of the fourth day, the skin of the chest was yellow, the pulse smaller, feebler. The yellowish color became more marked, he vomited a greyish and brownish liquid. A little later, and after the administration of a certain quantity of opium, the patient fell into a drowsy state, but from which he was easily roused. The redness of his eyes disappeared, the pulse became smaller, the centre of the tongue was red and dry. The next day, or at the close of the fifth day of the disease, the patient died, after a few hours delirium. He did not vomit during the last twelve hours of his existence, and at the autopsy a moderate effusion of blood, or of blackish matter, was found in the stomach and intestines, the gastric mucous membrane universally red, orange, and partially thickened;



the liver of an orange or yellowish greenish color, containing very little blood ; the other viscera natural, or nearly so.

Allowing the course and character of the symptoms which I have just enumerated to be in conformity with what authors have said of the yellow fever, and to belong to this disease alone ; it is not easy to explain them by the condition of the organs. The first symptoms, as the chills and shivering, followed by heat and thirst, would seem to announce the inflammation of one of the viscera ; and yet the mucous membrane of the stomach, the only organ manifestly inflamed, exhibited no symptom of morbid affection the first day of the disease.

Twelve or fifteen hours after the appearance of the first symptoms, the left hypochondriac region was painful on pressure, a very equivocal symptom of gastritis when not connected with other local symptoms. There was no vomiting till towards the close of the second day, though the castor oil previously given ought rather to have excited it, if the inflammation, which we are considering, had then existed, and especially to so marked a degree as to afford an explanation of the first symptoms.

As we have said, the stomach was the only organ manifestly inflamed, for there were no traces of any inflammation of the brain and thoracic viscera, and the mucous membrane of the two intestines was

almost natural. Except in the liver, there was nothing remarkable about the abdominal viscera. Nor can we find in the liver, altered as it was, any trace of inflammation, certainly not of acute inflammation. This organ was not redder, nor larger, nor more engorged with blood, nor more friable, than in the natural state. Its size, consistence, and firmness were natural, it was of a yellowish color, it contained less blood than usual; so that if we trace back the commencement of this lesion to the time of the appearance of the first symptoms, it would not explain them.

We must also conclude from this fact, that the disease at its commencement was not local, at least probably not. And if the early symptoms are not explained by the condition of the viscera, the death of the patient certainly is not. The brain, the heart, and the lungs deviated but slightly from the natural state, and though the mucous membrane of the stomach was manifestly inflamed, its consistence was nearly natural, showing that this inflammation had been by no means violent. And the lesion of the liver, however great may be its importance in other points of view, as we shall soon see, had very little to do with what we are now considering. The quantity of blood found in the stomach and intestine was not considerable, so that in the different lesions, taken separately or united, we find no explanation

of the fatal event, even when we bear in mind the rapidity, with which this took place. The probability is, then, that the cause of the disease, whatever it was, had a marked influence on the fatal termination, and on the development of the first symptoms.

We may remark, too, that several accidents occurring in the course of the continued fevers of our climate, "typhoid fever" did not show themselves in this case ; nor did we find the lesion which forms the anatomical character of that disease, Peyers and the mesenteric glands being perfectly natural.

But let us continue the exhibition of facts.

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## SECOND OBSERVATION.

RICHARD WOLY, a soldier of the twenty-third regiment, tall, of a strong constitution, of a moderate embonpoint, presented some slight febrile symptoms from the twentieth to the twenty-sixth of October, which were attributed to the prevailing epidemic, although unaccompanied by yellowness or vomiting. After a convalescence, apparently complete, of fifteen days, the same symptoms re-appeared, continued from the thirteenth to the seventeenth of November, and compelled the patient to return to

the marine hospital, where he was received for the second time, on the evening of the twenty-fifth of November.

Having dined that day with his usual appetite, he was taken at four o'clock in the afternoon with headache, pain in the loins and lower extremities, especially in the calves of his legs, without previous chills. An ounce and a half of castor oil, with five grains of calomel, and four oil enemata, were prescribed soon after his arrival. The epigastrium and other parts of the abdomen were indolent; he vomited once during the night.

The 26th, at ten o'clock, A. M., the face and neck were uniformly red, the chest injected, the eyes suffused, of a light uniform red, interrupted by blood vessels; the hearing acute; the intelligence perfect; the posture natural; the countenance slightly expressive of suffering, the headache severe, especially in the temples, the skin somewhat hot; the pulse sufficiently strong, regular, not large, ninety-two; the respiration equal, nineteen; the tongue natural; the abdomen supple, indolent; no nausea, no vomiting, no epistaxis. Twenty leeches to the temples, oil enema, mucilaginous drinks.

Notwithstanding an abundant evacuation of blood, the headache increased until the next day. Prostration without delirium. During the night and morning he vomited a greenish fluid repeated-

ly. The thirst was intense, the urine abundant, depositing a sediment at the bottom of the vessel.

The morning of the 27th, the abdomen was indolent, even in the right hypochondrium; no pain of the shoulder, the mind clear.

That evening the patient vomited his drink repeatedly, and had six dejections without pain; intense thirst; moderate heat; slept little during night; some difficulty in passing water.

The morning of 28th, distracted or meditative air; deep and frequent sighs; repeated complaints; mind clear; no headache; anxiety; hearing acute; eyes injected and of a light uniform red; skin of a natural color; tongue very moist, and universally white; epigastrium painful on pressure only; urine passed easily; pulse regular, large, undulating, slightly redoubled; heat increased without perspiration.

In the evening, severe pains, nausea, and vomiting. All the drinks came up in an acid state; the stools were numerous. Leeches were ordered to be applied to the epigastrium.

The 29th, the posture was natural; there was nothing remarkable in the countenance; pain in the knees and thighs; mind clear; at intervals dizziness, no ringing in the ears; eyes rose color, injected, slightly suffused, and of a slight yellow tint; tongue white and villous, no redness of its edges,

moist; sore throat, deglutition slightly incommoded; vomiting spontaneous, without effort; pains in the epigastrium; heat moderate; hands cool, feet warm; pulse one hundred, very feeble, irregular, sometimes intermittent, always difficult to feel; breast yellowish.

The 30th, groans, anxiety, frequent turning to right and left, severe pain in calves of legs, and thighs, in wrists and arms; air of disgust; the drinks vomited preserve their color, the whole abdomen indolent. The edges of tongue red, its central parts white and villous, becoming dry. Pulse very small, very feeble, unequal; impossible to follow. Urine easy; one stool.

Death at two o'clock, P. M.

*Autopsy twenty-four hours after death.*

EXTERIOR. — No yellowness, considerable cadaverous rigidity; round spots of an obscure red color on the anterior and posterior part of limbs and on abdomen of about the size of a dollar, and penetrating the corresponding cellular tissue to the aponeurosis. Superficial muscles of hams and of superior parts of thighs infiltrated by blood of a lac color.

HEAD. — No subarachnoid infiltration between the circumvolutions. *Cortical substance* of a clear grey, almost a rose color; the *medullary substance*



very much injected ; both of a good consistence, moist. A spoonful of clear serum in each of the lateral *ventricles*. Cerebellum, pons varolii, and medulla oblongata perfectly natural.

SPINE. — Two or three spoons full of bloody serum in the lower part of spinal arachnoid ; dura mater in some parts reddish ; spinal marrow perfectly natural, except a slight injection in the thickness of the lumbar enlargement.

NECK. — *Pharynx* and *larynx* moderately red, in other respects natural.

CHEST. — The *heart* of a proper size, healthy ; the *right* cavities contained about two ounces and a half of liquid blood, and in its *left* ventricle there was a very thin yellow fibrinous clot. The *aorta* unequally red, livid in its whole extent, contained rather a large quantity of liquid blood. The *lungs* filled exactly the pleural cavities, where they were perfectly free. Their inferior lobes were reddish, blackish, almost uniformly so without ecchymosis or hardness, of a good consistence and almost deprived of blood. The *bronchia* contained a small quantity of a red aerated fluid. No effusion in pleural cavities.

ABDOMEN. — No effusion. Inconsiderable meteorism in the whole extent of the intestinal canal. *Œsophagus*, blackish internally, deprived of its epithelium. Mucous membrane in other respects nat-

ural. *Stomach*, of a good size, containing a moderate quantity of a greyish brownish liquid, and in the midst of it a little mucus. The mucous membrane was white in the greater part of the cul-de-sac, and to the right of the cardiac orifice, greyish near the pylorus, of an unequal orange rose color elsewhere ; raised in an infinity of points of the great cul-de-sac almost simply by an emphysema of the corresponding cellular tissue ; emphysematous itself in some points of that region, it was slightly mamelonated anteriorly. Posteriorly, between the great cul-de-sac and the great curvature, in a surface of twelve or fifteen inches, there were a great number of whitish spots of about one line in diameter, which gave that part a dappled appearance, and opposite which this membrane had but a third part of the thickness which it had in surrounding parts. The anterior surface of the stomach presented a similar appearance, but less marked on account of a smaller number of spots, and of its not having become so thin. The thickness anteriorly may be estimated at less than a line, posteriorly at three quarters of a line, elsewhere it was not remarkable. The gastric mucous membrane was generally somewhat softened, and gave strips anteriorly of from four to six lines, posteriorly of from three to four lines, and near the pylorus of from six to seven lines. The *lymphatic glands* of the great and of the small curvature were



natural. The *duodenum* was unequally red in its whole length, and its mucous membrane, raised in different points by an emphysematous subjacent cellular tissue, it was of proper thickness and gave strips of three lines. The *small intestine* contained a moderate quantity of a liquid similar to that found in the stomach. Its mucous membrane was generally greyish greenish, in some points of a wine lees red; in the four feet near the cæcum, of a proper thickness; softened in a part of its extent so as to give strips three or four lines in length in its first third, four to five in its second third, shorter strips afterwards. In the last four feet were numerous points where the membrane had only the consistence of mucus. The *patches* of *Peyer* were healthy. The *mesentery* natural. The *large intestine* did not contain any black matter. Its mucous membrane was greyish, of a natural thickness and consistence, except in the cæcum, where it was somewhat softened. The *liver* was of a good size, flabby, but not softened, of a pale color; externally and at its large extremity yellowish or orange, of a greenish yellow to the left of its suspensory ligament. The color was the same internally in corresponding points, and this color in the right lobe was owing to orange points on a yellow ground, which points did not exist in the thickness of the middle lobe. The *gall-bladder* was of usual size, and contained a dark green liquid of

proper consistence. Its mucous membrane and that of the *biliary ducts* were natural. The *kidneys* were not remarkable except for the yellowish color of their cortical substance, and the livid tint of the tubular substance of the right *kidney* more particularly, where were six ecchymoses from two to six lines in width. The mucous membrane of the *bladder* was natural. The *spleen* was a little softened, of a wine lees color, and scattered about on it were a great number of whitish and greyish spots, which gave it a dappled appearance internally.

But for some slight differences in the symptoms, and the absence of the black vomit, this observation and the preceding are almost identical, and the same reflections are applicable to them both. After two slight attacks from which the patient was convalescent, and which the want of details does not permit us to characterize, a few hours after a repast of which the patient partook with appetite, he was taken with headache, pain in the limbs and loins. Eighteen hours later, the headache was intense; the countenance wore an expression of suffering; the face and the neck uniformly red, the eye suffused, of a light rose color; the breast injected; the pulse moderately accelerated; the whole abdomen supple and indolent. A little later, drowsiness and numerous vomitings supervened. The abdomen was still indolent at the close of the second

day. The intellectual powers remained free from any affection, there was headache and infrequent sleep. The patient groaned a good deal, and towards the close of the fourth day suffered from dizziness, and the same day a yellow tint of the sclerotic was noticed. The vomiting re-appeared, at first brought on by drinks, then spontaneous; the pulse was feeble, irregular, sometimes intermittent. Two hours before death, the patient was constantly anxious, vomiting drinks as soon as taken. At the autopsy, a moderate quantity of a brownish and reddish liquid was found in the stomach and small intestine. The mucous membrane of the stomach was of a rose color, mamelonated, thickened, and somewhat softened in a part of its extent; that of the ileum and commencement of the large intestine softened in a small extent. The color of the liver was altered, and the other viscera were natural. So that here again, we have at the commencement of the disease febrile and no gastric symptoms; and the vomiting came on after the administration of castor oil. Whence it follows, that the mucous membrane of the stomach, the only organ manifestly inflamed, was not inflamed at the commencement of the disease, that is, in all probability not; and here, as has been remarked in Fell's case, we find no explanation of the first symptoms in the condition of the organs. We can see only the

influence of some unknown cause on the economy. The alteration of the liver was the same as in the preceding case, and supposing that it may be traced back to the commencement of the disease, a question which we shall examine hereafter, it would not explain the febrile symptoms of that period. May not the same thing be said of the sub-inflammatory softening of the mucous membrane of the small intestine? And considering only these two facts, we should be led to think that the cause of the yellow fever of Gibraltar acted as those poisons, which however introduced into the economy, by the cellular tissue, the serous membrane, or otherwise, give rise more or less promptly to gastric symptoms, and to more or less extensive lesions of the mucous membrane of the stomach.

In other respects, the inflammation of this membrane, as shown by its rose color, its thickening, and a slight diminution of its cohesion, was moderate and partial; and the gastro intestinal hemorrhage was less than in the preceding observation. And if we could not explain the death by the apparent state of the organs in the first observation, still less can we do so in the second; so that here also, we must attribute a great deal to the cause of the disease. And, indeed, we must often do so in other kinds of death, in death from poison especially.

We may remark also, that if the lesions found at the autopsy were inconsiderable, the symptoms

themselves were not severe, the febrile symptoms were slight, the vomitings were not numerous, except on the last day, and there was almost no abdominal pain. And this mildness of the symptoms in a disease so rapidly mortal, goes to support what has just been said of the influence of the cause of the disease.

Though the patient did not vomit any brownish liquid, some was found in his stomach after death. Was it exhaled in the last two hours of his existence after we saw him for the last time? The contrary would not be impossible, for it is not unusual for the stomach to retain one liquid and reject another which has been received into it more recently. So that an affirmative answer to the question cannot be given, and, as we shall see hereafter, the state of the pulse is favorable to an opposite supposition.

The infiltration of blood in the substance of some of the muscles which were the seat of an acute pain, ought to be remarked on account of its extreme rarity in the Gibraltar epidemic. Finally, if the absence of stupor, ringing in the ears, meteorism, and diarrhœa, and the more rapid termination of the disease, distinguish it sufficiently during life from typhoid fever, the presence of a certain quantity of black matter in the stomach and intestine, the condition of the liver, of the small intestine, and of the elliptick patches of Peyer, are sufficient to settle the question after death.

## THIRD OBSERVATION.

JAMES LARRY, soldier of the twenty-third regiment, æt. 22, of a strong constitution, of middle stature, somewhat addicted to alcoholic drinks, at Gibraltar during the last four years, was received for the first time at the Marine Hospital the seventh of November, 1828. He exhibited then febrile symptoms unaccompanied by yellowness, which were of a short duration. Larry was received for the second time in the same hospital, the 23d of the same month, having experienced the day before, after ten day's convalescence, which appeared perfect, a rigor lasting four hours, headache, pain in the loins and limbs, nausea, and vomiting excited by soup. The 22d, almost immediately after the appearance of these symptoms, ten grains of calomel were prescribed with half an ounce of castor oil and an enema of salt and water. The 23d, three grains of calomel were prescribed, to be repeated; the camphor mixture of the London Pharmacopœia, with a small quantity of the spirit of Minde-  
rerus; and toward noon, a bleeding from the temporal artery. The patient had hardly lost three ounces of blood, when he was seized with a chill, became delirious, and it was thought proper to discontinue the bleeding. The head was shaved



and compresses of cold oxycrat were applied to it.

The 24th, at ten o'clock, A. M., the face was universally red, the eyes considerably injected, (chronic ophthalmia,) anxiety, frequent change of posture, constant complaints, headache varying in intensity, and in intervals of rest from severe pain inclination to drowsiness; intense thirst; tongue moist, its edges of a deep red color, its centre whitish; nausea, vomiting at intervals of whitish matter; epigastrium and other parts of abdomen very sensible on pressure; urine easy; pulse frequent, moderately large; heat great, skin not dry; at intervals, slight chills, or great sensibility to cold. Forty leeches were ordered to be applied to the epigastrium; frictions with hot vinegar, a warm bath, cream of tartar lemonade were prescribed.

A large evacuation of blood was obtained by leeches, continuing through the night; the vomitings were repeated almost every time the patient drank; the anxiety was prolonged until half past ten, when the patient slept a little until midnight. The 25th, at ten o'clock, A. M., the symptoms of the preceding day were noted, excepting the sensibility of the abdomen, which no longer existed; the pulse eighty, regular; the heat natural; the skin of a natural color. An application of vinegar and water to the head; Riviere's potion; an ounce of

the sulphate of Magnesia ; the simple camphor mixture ; lemonade.

The black vomit came on for the first time at eleven o'clock the same evening ; it was more abundant and of a deeper color at midnight, and continued so until morning, coming on as soon as the patient drank. The 26th, at nine o'clock, the vomitings continued, and hiccough was added to them. The color of the stools was natural ; the epigastrium indolent, except when the patient vomited. The countenance wore an expression of suffering, the mind not clear, slow ; the eyes universally red and injected ; the whole body yellow, especially the forehead ; the thirst intense ; the tongue clean, moderately red anteriorly, whitish posteriorly, thick and dry, though soft ; the pulse small, regular, eighty-four ; the skin generally cool, the hands and feet cold, although well covered up. The vomit on standing an hour was found separated into two parts, the one upper moderately thick, homogeneous, blackish soot color ; the other at the bottom of the vessel, of a deeper black color, apparently formed of a sort of pulverized detritus, really of a viscous fluid mixed with a black matter, sandlike. Hot applications to the extremities ; frictions of hot vinegar ; weak brandy and water for drink.

The hiccough and the vomiting continued, the



patient became delirious as soon as we left him, and died at midnight.

*Autopsy twelve hours after death.*

EXTERIOR. — *Embonpoint* moderate ; yellowish color universal ; muscular prominences marked ; cadaverous rigidity considerable ; muscles generally rather pale, without the least ecchymosis, firm.

HEAD. — One or two small tea spoons full of a slightly bloody serum in the superior *arachnoid* ; infiltration in the intervals of the convolutions of the *brain* ; *pia mater* moderately injected ; *cortical* substance natural ; *medullary* substance moderately injected ; both very moist, of a proper firmness ; two small spoons full of serum in the *lateral ventricles* ; *cerebellum*, *pons varolii*, *medulla oblongata* natural.

SPINE. — Limpid serum, the quantity of which could not be appreciated, in the spinal *arachnoid*. Spinal *marrow* in its whole length natural.

NECK. — *Pharynx*, *tonsils*, *larynx* and *trachea* of a livid color. Their mucous membrane in other respects natural.

CHEST. — A spoonful of yellowish serum in each pleural cavity. *Lungs* free, partially collapsed, brownish and violet posteriorly, where they presented several blackish spots, without any other sensible

alteration of their substance, except an increase of density in some points. A spoonful of yellowish serum in the pericardium. The *heart* of a larger size, and a more livid tint than is usual, of a proper consistence; the walls of the left ventricle near the base, eight lines in thickness; a few drops of liquid blood, no fibrinous clot, in the right and left cavities; *aorta* yellowish, without the slightest redness internally, containing a considerable quantity of liquid blood.

ABDOMEN. — No effusion. The whole intestinal *canal* of a greyish aspect, without the least meteorism. The *stomach* of proper dimensions, containing a glass of brown, thick, rather homogeneous matter, of the consistence of thin porridge. Its mucous membrane presenting folds of irregular forms, was of a slight orange tint, and almost universally mamelonated posteriorly. There were found several digital depressions, as if produced by a punching instrument, and some reddish bands having different directions, two lines broad, four to five inches in length, in the whole extent of which the mucous membrane was thinner by one third than in adjacent parts. This membrane was of a proper consistence, and we obtained strips of it five lines in length on its anterior face, from two to three lines in the great cul-de-sac, from five to six lines in the great curvature. Some arborisations

were seen in the mucous membrane of the *duodenum*, which had generally a greyish tint, a moderate thickness, and gave strips in its valvular portion of from three to four lines. The *small intestine* contained a great quantity of blackish matter, thin and more homogeneous than that of the stomach, thicker as we examined the intestine near the cæcum. Its mucous membrane and the sub-mucous cellular tissue presented numerous arborisations, especially in parts lying in the small pelvis. This membrane was of a proper thickness in its whole length, and universally softened, so that it had only the consistence of mucus in the five last feet of the ileum, and gave strips of from one to four lines as we retraced it towards the duodenum. *Peyer's patches* were natural. The *large intestine* contained a considerable quantity of a brownish matter, similar to that of the ileum. Its mucous membrane was greyish, of a proper thickness, gave strips of from two to three lines in the cæcum, and of from four to six farther down. There was nothing remarkable in the *mesenteric glands*. The *liver* was of a size proportionate to the stature of the subject; its suppleness and firmness were natural, its color was a clear uniform yellow, internally as well as externally. The red points were at once paler, smaller, and less numerous than in the natural condition. The sections of it had the moist appearance which is usual to them.

The *gall bladder* was natural, and contained a reddish and brownish liquid, thicker and more viscous than usual. The other viscera presented nothing remarkable.

The character, the succession of symptoms, the rapid termination of this disease, and the condition of the organs after death, remind us forcibly of the two preceding observations, and especially of the first, where the severity of the symptoms would inspire greater fears of the fatal termination of the disease. Larry, at the commencement of his illness, experienced a chill and violent shivering, headache, nausea, vomiting immediately after drinking. The chills were renewed at the commencement of the second day, at the moment that the temporal artery was opened; and twenty-four hours later the patient was sensible to cold, troubled with nausea, vomited a whitish matter, was in great anxiety, which continued almost uninterruptedly till death. The vomitings continued also, excited by all drinks, and as they were accompanied by sharp pains in the epigastrium, the patient feared to satisfy his thirst. Twenty-four hours before the fatal termination they became black, the pulse was small and feeble, the patient became yellow, delirious, and died after an illness of four days and a half. At the autopsy we found a slight subarachnoid infiltration; a very

small quantity of serum in the abdomen ; a glass of blackish matter in the stomach, its mucous membrane inflamed ; that of the small and large intestines more or less softened ; the liver of a clear yellowish color, without other lesions ; the rest of the viscera natural, or nearly so.

In this observation, as in the two first, the mucous membrane of the stomach was the only part evidently inflamed ; its inflammation was partial, generally very moderate, considering its natural consistence, and slight redness. And we ought to expect more considerable lesions on account of the numerous vomitings, and the anxiety which the patient experienced ; though we must not forget the red band, along which the mucous membrane was very thin, and to which ought to be attributed partly, and without any doubt, the violent symptoms.

But one thing which we must remark in passing, as distinctive of this observation, is that the stomach appeared to be affected at the commencement of the disease, or very nearly so, since at that time the drinks excited nausea and vomiting. Must we conclude also that the mucous membrane of the stomach was inflamed at that time, and that the febrile symptoms were only the effect of that inflammation already commencing ? Certainly not — for similar vomitings are excited in the same way in several acute diseases without any inflammation of

the mucous membrane of the stomach, and we shall see hereafter the reasonableness of being thus cautious.

Another fact not less worthy of remark, and of which mention has not been hitherto made, is the diminution of the temperature of the body at the appearance of the black vomit ; and which was undoubtedly, or at least in great part, the result of the gastro-intestinal hemorrhage ; and the appearance of which in the absence of other and more characteristic symptoms, may denote the commencement of this hemorrhage.

The alteration of the liver, which does not resemble any of those observed in the course of the acute diseases of Paris, was still more marked than in the preceding case, although the fatal termination took place in the middle of the fifth day ; showing in an unequivocal manner that this alteration commenced with, or very soon after, the disease itself.

Here, also, as in the other cases, Peyer's glands and the mesenteric glands were in a natural state ; nor were the symptoms at all those of typhoid fever, so that we have a broad line of demarcation between that affection and the one we are now considering.

As to explaining the death by the condition of the organs, we do not believe it possible, notwithstanding the more abundant hemorrhage ; and though



the mucous membrane of the small intestine was softened in a great extent.

But let us pass on to another fact not less important than this last.

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## FOURTH OBSERVATION.

JOSEPH PERES, a soldier of the twenty-third regiment, æt. 22, of a moderately strong constitution, perfectly well formed, at Gibraltar during the last eighteen months and previously to that time in Portugal, was received in the Marine Hospital on the second of December, having been ill since midnight. He had not mounted guard either in the city or at the southern gate, he had been sentinel in the hospital only, the interior of which he assured us that he had not entered, adding that no one had been ill in his tent in the course of the last three weeks. He was perfectly well on going to bed, but in the middle of the night there came on chills and soon after, flushes of heat intermitting with the chills; headache; pain in the epigastrium. The patient still complained of cold when he entered the hospital at three o'clock in the afternoon, and he was warned

by means of three thick coverlets. The headache and the pains of the epigastrium continued, there were nausea and green and black vomit the same day, and in the night of the second and third. Castor oil, and enemata were given to the patient soon after his arrival in the hospital, and were followed by twelve stools.

The third, at ten o'clock, A. M., thirty-four hours after the commencement, moderate and uniform color of the face, permanent closing of the eyelids, acute sensibility of the eyes to light, the eyes suffused, of a uniform rose color, very much injected; the hearing acute, ringing in the ears; the mind clear, general uneasiness, sensation of great weakness without prostration, so that the patient got up to go to the stool; headache less than on the preceding day; pain in the limbs and loins; sensation of a cold liquid running down the back; pulse regular, resisting, one hundred; skin moist, hot, slightly injected; tongue moist, its central part red, its edges white; acute pain in epigastrium, increasing on pressure, and without local heat. Fifteen leeches were ordered to be applied to the temples. Castor oil with a drop of croton oil, and mild drinks were prescribed.

The loss of blood was small and followed by a slight diminution of the headache and of the sensibility of the eyes to light. The epigastric pains



were quite acute, and the vomitings numerous, of a greenish and bitter fluid, coming on after and in the intervals between drinking ; tenesmus.

The 4th, at ten o'clock, A. M., the posture was natural ; the face moderately colored, with a slight expression of discomfort ; the headache less, the eyes less red, less injected, not as much suffused, scarcely sensible to the light ; the hearing acute, some ringing in the ears ; sleep at intervals, troubled by dreams ; weakness so as to prevent the patient from getting up and going to the stool ; pulse small, contracted, regular, ninety-two ; heat of skin moderate ; breast slightly injected ; tongue moist, its middle part and edges red ; nausea ; vomiting at intervals ; slight epigastric pains. A blister was ordered to be applied to the epigastrium.

The patient was calm during the day, but towards evening suffered from acute pains in the loins. In the night, and until eight o'clock the next morning, he vomited repeatedly a fluid of a dark grey color.

The fifth at nine o'clock, the face was rather pale than red, the features sunken, slight headache, pain in the limbs ; the epigastrium and the rest of the abdomen indolent. The patient, despairing of recovery, commended himself to God, and listened to no encouragement. His pulse small and regular, his skin dry and parched, his eyes slightly red and in-

jected; the tongue moist, its middle part of a deep red color; hiccough since midnight. Hot spirituous applications were made to his feet through the day, weak brandy and water was given him for drink, and he died the next day at half past seven o'clock.

*Autopsy five and a half hours after death.*

EXTERIOR. — Livid stripes on the sides of the neck, and on the posterior parts of the body. Slight yellow color of chest and abdomen, none of lower extremities. Corpse still warm, cadaverous rigidity considerable.

HEAD. — Numerous drops of blood on the external surface of *dura mater*. Two spoons full of clear serum in the *arachnoid*; slight sub-*arachnoid* infiltration in the intervals of the cerebral convolutions; *pia mater* slightly injected in some points. *Cortical* substance natural; *medullary* substance slightly dotted with blood; both of a good consistence, a small spoonful of reddish serum in each lateral *ventricle*; some drops of the same liquid in the fourth *ventricle*. *Cerebellum*, *pons varolii*, *medulla oblongata* perfectly natural.

SPINE. — Four or five spoons full of clear serum in the inferior part of the *arachnoid*. Spinal mar-

row of a natural size and consistence in its whole length.

NECK. — *Pharynx*, *epiglottis*, *larynx*, and interior of *trachea*, of a deep red. Their mucous membrane in other respects perfectly natural.

CHEST. — No effusion in the *pericardium*. *Heart* rather small, of a natural consistence and firmness, containing a small quantity of liquid blood. Some was found also in the *aorta*, which was of its natural color. The inferior lobes of the two lungs of a reddish color, with black spots from two to five lines in diameter behind and on the sides. The pulmonary tissue corresponding to these spots, was internally as well as externally firm, scarcely moist, not granulated, without air, moderately friable. No effusion in the pleural cavities.

ABDOMEN. — No effusion. The *æsofagus* contained a small quantity of a reddish liquid. We found on it vertical bands from one to two lines in width, where the *epidermis* still existed, and separated from each other by spaces of the same width, along which the mucous membrane was bare and reddish, whilst its color was whitish under the epidermis. Everywhere else its consistence and firmness were natural. The *stomach*, not as large as usual, contained about a pound of a blackish moderately thick liquid, leaving a reddish tinge on the sides of the vessel in which it had been received, as it was

turned out from it. On its mucous membrane was a lining of thin mucus. This membrane was of a pale red color, and presented several folds in its upper three fourths, except along its small curvature in the length of an inch and a half; and except this last part, and the neighborhood of the cardia and pylorus, it was mamelonated in its whole length. This appearance, which was very marked on the great curvature, especially on its middle part, was interrupted by four digital blackish depressions, the mucous membrane here being very thin and covered by a colorless mucus. This membrane was at least a half a line in thickness in the middle part of the great curvature, and was proportionately thickened wherever it was mamelonated. It had generally a less consistence than is usual. The mucous membrane of the *duodenum* was of a slight orange red. The portion near the pylorus was not remarkable in other respects, that lower down was of a proper consistence and thickness. The crypts were a little more developed than usual. The *small intestine* was of a moderate size, and contained a little brown or black fluid in a very limited part of its extent corresponding to the ileum. Its mucous membrane was injected, of a clear red in the first four feet of the jejunum, of a violet color in that portion of the ileum which lies in the *small pelvis*, of a natural color elsewhere. It gave strips of from five to

six lines in the first half, of from four to five lines in the second half, and its thickness was as usual. The elliptical *patches* of *Peyer* were in the natural state, and some single *glands* were seen near the ileo-cæcal valve. The *large intestine* contained a small quantity of a light wine lees colored, liquid; its mucous membrane was similarly colored, but unequally so, more marked in the first than in the second half. Its strips were four lines in length in the right and transverse colon; shorter lower down. In the second half were some traces of a false membrane, and its thickness was less than usual. The *mesenteric glands* were natural. The *liver* was of a moderate size, rather pale, spotted with yellow externally and to the right of its suspensory ligament. The spots were found internally in the great and middle lobe. The last was paler than the first. The *biliary ducts* free. The *gall-bladder* of a less size by one half than is usual, contained a thick blackish bile. The *spleen* longer than common, otherwise natural. The other viscera not remarkable.

With some inconsiderable exceptions, the symptoms and the lesions are the same here as in the preceding cases, and death took place even at an earlier period, or after a disease of four days and seven hours. At the commencement, there was a violent chill, headache, pains in the epigastrium; the pain

acute the second day of the disease, less the third day, when it ceased. The vomitings took place twenty-four hours after the chill, and were renewed the following day ; but no blood or black matter was vomited at any period. The pulse at a hundred the second day, passed from ninety to seventy-six ; the heat moderate. The breast injected the third day, of a yellow tint twenty-four hours before death. The weakness was considerable the third day, but the mind remained clear till the end. The hearing acute, the eyes more or less red ; and at the autopsy, made five hours after death, a pound of black matter was found in the stomach, and a wine lees colored brownish liquid in both intestines ; the mucous membrane of the stomach reddish, mamelonated in its whole extent, thickened and slightly softened ; that of the large intestine softened to a remarkable degree, without increased thickness ; the liver pale and spotted with small yellow patches ; the other viscera in a condition nearly natural.

As I have said, this fact differs hardly from the preceding ones. The inflammation of the gastric mucous membrane was more extensive, but not more intense than in other cases. On account of the period at which the epigastric pains were felt, it might be asked if the inflammation commenced at the time of the appearance of the first symptoms, and



explained them. There was no black vomit, although at the autopsy a black fluid was found in the stomach.

This alteration of the liver, though less marked than in the other cases, was evidently of the same nature. The state of the colon and that of the pulmonary parenchyma varied more from that of those organs in the first subjects. The softening of the mucous membrane of the colon was inflammatory in a certain part of its length, in which traces of false membrane were found, but the spots of the parenchymatous pulmonary tissue with the hardening of corresponding parts were not of the same character. But, as we shall see hereafter, these slight differences do not involve the essential character of the disease; and in calling the attention of the reader to the redness of the face and eyes of this patient, I wish to remind him that the same redness was noted in the preceding observations, and to suggest that these symptoms may be important in the diagnosis of the disease we are studying.

If any one is disposed to connect the sensation of a cold liquid along the back, experienced by the patient, with the considerable quantity of serum found in the spinal canal, I shall reply to him, that besides the difficulty of conceiving the relation between the effect and its presumed cause, the same sensation

was not experienced in other cases, where the quantity of serum contained in the spinal canal was not less considerable.

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#### FIFTH OBSERVATION.

PATRICK PRURDERVILLE, a soldier of the twelfth regiment, æt. 28, of rather a strong constitution, black hair, a bronzed complexion, at Gibraltar during the last five years, was brought to the Northern Hospital the 26th of November, 1828, at nine o'clock in the evening, an hour after the attack. Having been troubled with diarrhœa during ten days at the camp and at the hospital for the wounded, he was seized at the commencement of his present disease with a violent chill accompanied by shivering, an intense headache, pains in the calves of the legs, cramp of the stomach. A moderate heat had succeeded the chill, and the same evening the patient took an ounce of castor oil, five grains of calomel and five grains of James' Powder with an oil enema. The castor oil was vomited, and the enema followed by some dejections.

The morning of the 27th, the intense headache continued; the epigastric pain and that of the



calves of the legs were less severe ; the thirst intense ; the skin moist ; the tongue whitish and villous ; the pulse very much accelerated. A bleeding of twelve ounces, another dose of castor oil, compresses of cold vinegar and water to the head, were prescribed.

The coagulum of the blood quite firm, no buff. In the afternoon there were prescribed an ounce of castor oil with twenty-four drops of laudanum to prevent vomiting, and in the evening four or five grains of calomel. None of these medicines were vomited ; the epigastric pains continued. The headache and the pains in the loins diminished during the night. The cramps of the stomach did not change, the patient had two stools and vomited several times. The morning of the 28th, twelve leeches to the epigastrium, and frictions of antimonial ointment on the loins, were prescribed. Towards noon an assistant surgeon perceiving the vomiting to continue, prescribed a few grains of ipecac. Three hours afterwards the patient continued to vomit, and there was considerable anxiety.

The symptoms continued during the night, and at one o'clock in the morning the patient was taken with hiccough, which, relieved for the moment by Riviere's potion, became again very troublesome between five and six o'clock, a period, when the illness of the patient, who had become slightly deliri-

ous, appeared to increase every moment. It was the 29th, a blister to the neck and a little cold brandy and water were prescribed.

The vomitings, interrupted for a short time towards ten o'clock, came on again soon after with renewed violence. They were of a brown color, composed in part of a viscous matter which remained at the bottom of the vessel, and were accompanied by hiccough. They continued without change of character, and at three o'clock in the afternoon the patient was found, his head over the edge of the bed, and vomiting without effort almost constantly. His pulse was regular, but extremely small and feeble, the skin cooler than natural. A piece of toasted bread, dipped in an aromatic tincture, was applied to the epigastrium, and the vomitings ceased for several hours. They came on again, and the patient died on the morning of the 30th, at five o'clock.

*Autopsy nine hours after death.*

EXTERIOR. — Yellowness of trunk moderately deep, that of lower extremities very slight. Considerable cadaverous rigidity. Muscles of a natural color and firmness.

HEAD. — Slight sub-arachnoid infiltration, limited to spaces comprised between the convolutions of

the brain. Very slight injection of the *pia mater*. *Cortical* substance of a natural color; *medullary* substance moderately injected, moist; both of a good consistence. Two small spoons full of serum in each lateral *ventricle*. The *cerebellum*, the *pons varolii*, and the *medulla oblongata* natural.

SPINE. — At least three spoons full of serum in the lower part of the spinal *arachnoid*. The spinal *marrow* perfectly natural in its whole length.

CHEST. — *Pericardium* natural; *heart* of a good size; its walls of a natural consistence and thickness; the *ventricles* contained a moderate quantity of liquid blood, and several yellowish clots, the sygmoid and mitral valves being of the same color. The *aorta* had a slight yellowish tint, no red spots, and contained a great deal of liquid and clotted blood. The *left lung* was of a light violet red behind and below, contained little blood, and was in other respects perfectly natural. The color of the *right lung* was natural, except in its lower lobe, which was blackish in a space as large as the fist, of a consistence greater than that of hepatized lung, of an uneven aspect, moist, not granulated. The mucous membrane of the *trachea* and *bronchi* was of the color of onion parings, its thickness and consistence natural; no effusion in the *pleura*.

ABDOMEN. — Its conformation perfect. No effusion in the peritoneal cavity. *Æsophagus* mode-

rately distended by a matter similar to that found in the stomach. Its mucous membrane deprived of epidermis, of a wine lees color in its whole extent, in other respects natural. *Stomach* of a proper volume, containing about two pounds of a blackish liquid, which, a quarter of an hour after being received into a vessel, separated into two parts; the one above, homogeneous, brownish, of the consistence of a thin solution of gum; the other below, more viscous, and in the midst of it an infinity of small blackish bodies. The mucous membrane of a rose orange color in the great cul-de-sac, paler elsewhere, and lined in its middle part by a moderate quantity of viscous mucus. In the same region were numerous folds, and in the two superior thirds a mamelonated appearance. This appearance was very marked near the small curvature, and less so towards the great curvature. The *mamelons* were very unequal, and amongst them were five digital depressions, and a sixth, two inches long by two lines wide. The thickness of the mucous membrane in this point was one half less than in surrounding points. In other respects the consistence of the membrane was natural, except in some points near the small curvature, where its strips were from three to five lines. The mucous membrane of the *duodenum* was reddish in the pyloric portion, of a similar color, but more marked, farther down. There

was nothing else peculiar in its first part; in the second part it was thickened, and gave strips of from three to four lines, and the crypts here were rather more developed than usual. The first half of the *small intestine* was of its usual size, and contained a considerable quantity of a blackish brown matter, much more separated than in the stomach. The second part was somewhat contracted. Its mucous membrane was of a grey slate color in the jejunum, in consequence of a very great number of small black points grouped together and corresponding to projecting villousities, the number of which diminished in approaching the ileum, where they were no longer seen. The mucous membrane was reddish here in some parts, a little thicker than natural in several other parts, and its strips were generally from three to five lines in length. *Peyer's glands* were not remarkable. The *large intestine* contained a small quantity of a greyish yellowish pultaceous matter. In the first two thirds, the color of the mucous membrane was natural, farther down, it became livid, as if mamelonated, and ten ulcerations, each a line in diameter, were found. Its thickness was double that which is natural to it, and so soft was it that no strips, or strips from half a line to a line in length only, could be obtained; whilst in the first two thirds they were from five to twelve lines. Some of the *mesenteric glands* cor-

responding to the jejunum were red and of double the usual thickness. The *liver* was of a good size, its consistence less than natural. It was of a yellowish color in its whole thickness, more marked in its middle than in its great lobe, where the red points were pale and few in number. The *biliary ducts* were natural; the *gall bladder* small, in other respects natural, and the bile which it contained thick and of a dark color. The *spleen* and the other viscera were not remarkable.

Although the patient had a little diarrhœa when attacked by the epidemic, the form of his disease was not altered in a sensible manner, and the remarks already made may be applied here. The patient was taken with a violent chill, cramp in the epigastric region, and the pain continued during two successive days. The vomitings, excited at first by the castor oil, became spontaneous. Suspended for some hours by a small quantity of opium, they became very frequent, especially after the administration of some grains of ipecac given with the intention of restraining them. Twenty hours before death they were brownish, and they ceased and returned alternately. There was a momentary affection of the mind a day before the fatal termination; and at the autopsy we found the mucous membrane of the stomach of a clear rose or orange



color, mamelonated in its two superior thirds, thickened without being softened, or only so to a slight degree, and to a small extent ; the mucous membrane of the colon ulcerated, and manifestly inflamed in its last third ; the liver yellowish ; and a considerable quantity of black matter in the stomach and first half of the small intestine.

As in the preceding observation, there were pains in the epigastrium from the commencement, and it may be asked here again if this pain at the beginning was not a symptom of the commencing inflammation of the mucous membrane of the stomach, so that if this inflammation would appear to have been sequent in the two first patients, it would seem to have commenced simultaneously with the disease itself in the two last. I have nothing to add to what I have previously said of the necessity of suspending our judgment as to this point, and I will only say that if the inflammation we are considering was remarkable for its extent, it was much less so for its degree, and that in this case, as in the greater part of the preceding, it would have been thought much more severe before the post mortem examination, — an important point on which I shall have more to say hereafter.

In other respects, except the ulceration, and the highly inflammatory softening of the mucous membrane of the colon, effect more than probable of the



enteritis which existed anterior to the attack of yellow fever, the other lesions, those of the liver in particular, were the same with those we have found in the other cases ; and the partial alteration of the pulmonary tissue does not differ from that which has been described in the fourth observation.

So far, then, we have four kinds of lesions in all the cases : yellowness ; exhalation of a greater or less quantity of blood, or of black matter in the stomach or intestine ; inflammation more or less extensive, but always moderate of the gastric mucous membrane ; yellow or yellowish color of the liver. But we must not infer that it is always thus. Facts would falsify so hasty a conclusion, and the rigorous analysis of all the observations which M. Trousseau and myself have collected, will show which amongst these lesions may be regarded as essential to the disease we are studying.

The observations which precede, are sufficient to show that the disease which prevailed in Gibraltar as an epidemic in 1828, was the yellow fever, so that I shall give no more of them in this first part of my work, but I shall pass to the second part, which is appropriated to the general description of the organs and of their lesions.

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SECOND PART.

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GENERAL DESCRIPTION

OF THE

VISCERA.

In this description, which is founded on twenty-five autopsies, twenty-three of which are of subjects who died of the yellow fever, I shall expose successively the external condition of the body, and the state of the viscera contained in the three great splanchnic cavities ; commencing with those which deviated the most rarely from their natural state. I shall point out the proportionate frequency of these lesions, and the period at which they were developed. I shall endeavor to appreciate them, and I shall compare them with what is analogous to them in subjects who die of the acute diseases of Paris.

## PART II.

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### CHAPTER I.

#### EXTERIOR OF THE BODY.

THE greater part of the subjects whom we have examined were soldiers, all in the vigor of life, perfectly well formed, some of them athletic. In all, there was great cadaverous rigidity, and in some, the muscular prominences were as well marked as they could have been during life when in a state of strong contractions. This rigidity was found in subjects opened five and a half hours after death, and before they were perfectly cold.

The skin was yellow in all except three (Obs. 14, 2, 9); and when the yellowness was not well marked, it was more so on the trunk and about the head, than on the limbs, and in some subjects it was very slight over the whole extent of the limbs.

As the yellowness did not exist in all those who died of the yellow fever of Gibraltar of 1828, we

cannot regard it as essential to, or as forming one of, the necessary characteristics of that disease.

Stripes were seen on the anterior and lateral parts of the body in two cases only (3, 17). In a third, there were ten rounded spots on the skin of the size of a dollar, which penetrated to the aponeurosis (2).

The muscles had their natural color, firmness and cohesion, and were not flabby in any case. In one of the cases to which we have just referred, the superficial muscles of the calves and hams were infiltrated with blood (2).

Although the disposition to hemorrhage was manifest in the course of the yellow fever of Gibraltar, still, that it was not so great, and less universal than one would have thought, is shewn by this fact, that in one only of twenty-three cases was there a slight exhalation of blood in the subcutaneous cellular tissue, and in the superficial muscles.

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## CHAPTER II.

## BRAIN, SPINAL MARROW AND THEIR APPENDAGES.

## ARTICLE I.

## BRAIN.

THE arachnoid cavity contained in four individuals in its upper half about five small spoons full of serum; the serum bloody in two cases, clear and limpid in two others, (4. 8). It was not remarkable in the other subjects.

The infiltration of the sub-arachnoid tissue was more frequent. It was found in two thirds of the cases, in sixteen subjects; it was generally slight, particularly so in seven of their number, in whom there were no traces of it, except in the intervals between the convolutions. The infiltrated fluid was limpid, except in one case, where it was at the same time red and abundant, (24).

In all, the lateral ventricles contained some serum, generally very little; so that there were only a few drops of it in one of the subjects, a small spoonful

in the two ventricles in seven individuals, two spoons full in seven others, from three to six spoons full in nine, a little more in the others, and finally, one individual, whose history I shall presently give, had three spoons full of clear serum in the right ventricle.

This fluid was not turbid in any case. In some it had a slight yellowish tint, was more or less red in four; the fluid contained in the spinal arachnoid was of the same color in one subject. The pia mater was more or less injected in six cases, to three of which we have just referred, and in which the cortical substance was to a greater or less degree of a rose tint.

The color of the cortical substance of the brain was altered in eight subjects; of a pale or bright red in five, violet or lilac color in others, a color which existed in the whole thickness and extent of the cortical substance. This substance presented no other appreciable alteration.

The medullary substance had almost constantly its natural aspect, and we have found it injected to any remarkable degree in four subjects only. In another, it had a lilac shade in some points; in all, it was of a good consistence, and there was no softening in any part of it.

The cerebellum was almost in the same state as the brain, the cortical substance was of a rose, more or less bright in three subjects, of a violet rose in



three others; the consistence of this organ appeared generally diminished in one case only.

The following observation relative to an individual who died in the Civil Hospital presents nearly all the slight lesions which have just been enumerated. The history of the symptoms in this case has been kindly furnished us by Mr. Frazer the surgeon of that hospital.

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#### SIXTH OBSERVATION.

JOHN WALPOLE, a school-master, æt. 32, was brought to the Civil Hospital the 22d of December, having been ill five days. He said that he had had the yellow fever in 1814, did not believe his present disease to be the yellow fever. He appeared quite ill. A short time after his arrival, they gave him calomel and jalap which produced abundant dejections.

The 23d, his tongue was covered with a thick yellowish coat, he complained of pain in the right hypochondrium, and in the throat, his eyes were yellowish and languid.

The same day towards evening, he vomited a black fluid, and he died the next morning in the

midst of similar vomitings, after an agony of twenty-four hours.

He had been addicted to the use of alcoholic liquors.

*Autopsy twenty-six hours after death.*

EXTERIOR. — The body well formed; universally yellow, the trunk and superior extremities of a deep yellow, the lower extremities of a lighter tint. Numerous *stripes* laterally and anteriorly. Cadaverous rigidity; no green color of the abdomen.

HEAD. — Considerable sub-arachnoid infiltration; veins gorged with blood; cortical substance violet, of a livid rose color; *medullary* substance injected, lilac in a great many points; both of a good consistence. Four spoons full of a slightly yellowish clear serum in the right *ventricle*; one spoonful in the left. The *cortical* and *medullary* substances of the *cerebellum* presented the same appearance as those of the *brain*. The *pons varolii* was livid in its whole thickness, of a good consistence. The *medulla oblongata* perfectly natural. One spoonful of serum in the *occipital fossæ*.

NECK. — *Pharynx* slightly red; *epiglottis*, *larynx* and *trachea* natural.

CHEST. — A spoonful of lemon colored serum in the *pericardium*. The *heart* of a good size, of a natural color and firmness; a yellowish clot in each

*ventricle*. The *aorta* contained a great deal of liquid or slightly clotted blood, was reddish in its whole length, the red color more intense in the parts corresponding to the bodies of the *vertebræ* than any where else, existing also in a part of the thickness of the middle coat; the two coats were of their natural consistence and thickness. The *lungs* free, small, heavy, violet colored posteriorly, where a few distinct spots were seen, but no hard lumps; they contained little air and some blood.

ABDOMEN. — No effusion in this cavity. *Æsophagus* deprived of its epithelium in its lower three quarters. *Stomach* a little larger than natural, containing a moderate quantity of mucus, thin, and of wine lees color. There were some livid red bands on its mucous membrane, which had a rusty color more or less marked in its whole extent, and a marked mamelonated aspect, except in the superior half of the great cul-de-sac, in the width of three inches in the small curvature, and near the pylorus. This membrane was thicker than natural in its anterior and superior half. The mucous membrane of the duodenum was of a delicate rose color, somewhat livid, of a moderate thickness. Its strips were only one line. In other respects it was not remarkable. The *small intestine* contained in its first half a blackish matter of the consistence of mucus, and in its second a moderate quantity of natu-

ral mucus. Its lining membrane was white or ruddy in its whole extent; it gave strips of from four to five lines in the *jejunum*, of from six to eight lines in the ileum. *Brunner's glands* were not to be seen, and those of *Peyer* were natural. The *large intestine* contained in its first half a little pultaceous fœcal matter of a wine lees color. Its mucous membrane was of a natural thickness and consistence. The *liver* was of a good size, universally yellow, of an orange yellow at the large extremity, of a slight pale rose tint in some points in the interior, where the two substances were not to be distinguished. The section of it had a dry smooth aspect. The *biliary ducts* were natural, there was a little bile of a deep green color in the *gall bladder*, which in other respects was perfectly natural. The *spleen* and the other abdominal viscera were natural.

Thus, as we have already said, the greater part of the slight lesions we have described were found in the brain; a sub-arachnoid infiltration, an effusion of yellowish serum in the lateral ventricle, the cortical substance of the brain of a violet rose color, the medullary injected, of a lilac color; the cerebellum and the pons varolii in like condition; mostly slight lesions and which were partly owing to the long agony of the patient, and which were in part the cause of it; for we find them and to the same degree, un-

der the same circumstances, in patients who die of other acute diseases, not of the brain.

And though all the symptoms of the case have not been noted, we can have no doubt of the character of the disease. It was rapid, of six days and a half duration ; the patient was yellow ; the black vomit came on ; the stomach contained a small quantity of the same fluid, its lining membrane mamelonated and partially thickened ; the jejunum contained a black fluid ; the liver was almost uniformly yellow, and Peyer's patches were natural. So that not only have we here the principal symptoms of the yellow fever, but also the post mortem appearances, which so far we have found in individuals who have died of this disease, and none of those lesions which characterize the acute diseases of Paris.

We may remark also, that if some of the most inconsiderable of the morbid appearances, as the red color of the aorta, the rose or violet tint of the cortical substance of the brain and of the cerebellum, for example, were the result of a simple congestion or imbibition, neither of these causes have acted on the other organs, and particularly not on the gastrointestinal mucous membrane which retained almost entirely its usual consistence and color. Here then again, is a fact to be added to those which prove that imbibition requires peculiar conditions of the solids or of the liquids, or of both.

In the slight alterations of the brain and of the parts connected with it which have been described in this article, there is nothing peculiar to the yellow fever. They are observed more or less frequently in subjects who have died of the most common acute diseases. And speaking only of the rose or livid color of the cortical substance of the brain and the cerebellum, it is more frequently observed in individuals who have been carried off by typhoid fever, than in those who have died of yellow fever and whose histories we are now studying.

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## ARTICLE II.

### THE SPINAL MARROW AND ITS MEMBRANES.

We found from two to four spoons full of clear serum in the arachnoid spinal cavity in all the cases where the spinal canal was opened. In one case the serum was more or less red. The *spinal marrow* examined in the same number of cases, presented nothing remarkable, if we except three, where, in its whole length it had a greater or less degree of consistence than usual. This however seemed to be the natural condition, for these two opposite degrees of consistence cannot be considered as pathological on account of the absence of every symptom which could be referred to a lesion of the



spinal marrow. Nor would it be easy to explain the diminished consistence of this organ in two cases by a commencement of decomposition, the autopsy of one of the two having been made five hours after death. So that we must recognise in this case the law, according to which the integrity of our organs and of their functions is compatible with different degrees of consistence.

There is nothing in these appearances which can be regarded as peculiar to patients attacked by yellow fever. An equal quantity of serum is found in the spinal canal of individuals who have died of other acute diseases.

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## CHAPTER III.

### RESPIRATORY APPARATUS.

AIR PASSAGES; PULMONARY PARENCHYMA; PLEURÆ.

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#### ARTICLE I.

##### AIR PASSAGES.

THERE was nothing remarkable in the air passages, except a livid color in several cases, sometimes more, sometimes less marked. This was seated



partly in the sub-mucous cellular tissue, and partly in the corresponding mucous membrane, which very rarely presented any other lesions. It was at the same time red, and swollen towards the epiglottis, in one case, (23); of a dark red around it only in another.

The laryngeal mucous membrane was of an intense red in two subjects.

The same was true of the trachea in one case; in another the mucous membrane was of the same color and softened, consequently inflamed.

We found no ulcerations, no traces of false membranes in any point of the extent of the air passages in any subject; so that one thing may be said with great truth, that the mucous membrane which lines them was more constantly natural, and to a more remarkable degree, in the individuals whose histories we now study, than in those who die of the acute febrile diseases of Paris. But what disease of the kind is accompanied by as slight febrile symptoms as the yellow fever?

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## ARTICLE II.

### LUNGS.

THE lungs were more or less smooth in the greater part of the cases, but we have found them entirely natural in three subjects only.

In five their volume was considerable, and this depended, in great part, sometimes on the dilatation of the pulmonary vesicles, sometimes on different lesions which we are about to describe.

These were either black spots of from two to five lines in diameter, or masses of the same color more or less impermeable to the air, or else they were the first and still more rarely the second degree of pneumonia.

The spots were found in nine subjects, sometimes without complication, sometimes with the lesion of which we have just spoken. Usually of a brown black, rarely of a crimson hue; they were more or less concentrated, and occupied a variable space at the exterior or in the interior of the lung, and in some cases they were found only in the lower lobe. Placed on a rose or red ground, the tissue, in the midst of which they were placed, had a spotted appearance. The density of the tissue, which was the seat of them, was not manifestly increased, except in two cases; this increase of density being the manifest result of an effusion of blood more or less intimately combined with the pulmonary tissue.

The black or blackish masses existed in six individuals, (5, 7, 15, 18, 21, 22,) their consistence was greater or less, they contained no air, they had not the granulated aspect of the hepatized lung, they presented but slight traces of organization, so that

merely some cellular fibres irregularly disposed, might be distinguished in them. Usually they could be easily broken down, in some cases also they yielded by pressure the blood of which they were almost entirely composed, and the pulmonary parenchyma remained apparently of its natural consistence. In one case it was impossible to remove the blood by a gradual and moderate pressure, and here the tumor or mass was as large as the fist, had more cohesion than the parts in the second degree of pneumonia, and less than the parts in the state which the illustrious Laennec has designated as pulmonary apoplexy (5). The same was true in another subject, in whose lungs we found from twenty-five to thirty tumors of this same character, though of a little different aspect, and somewhat resembling the thyroid gland. Their structure was apparently homogeneous, quite friable, and as in the other cases, there was no line of demarcation between them and the pulmonary tissue.

We have not seen during life the patient whose body presented this lesion. The disease was fatal the fourth or fifth day, and we feel ourselves bound to give here the result of our anatomical investigations.

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## SEVENTH OBSERVATION.

*Autopsy the 23d of December, eleven hours and a half after death.*

EXTERIOR. — A red black fluid on the lips and on a part of the face, with a little froth; body of a tall and moderately fleshy man; universal greenish yellow color; muscular prominences well marked; considerable rigidity; traces of a blister eight inches in diameter on the middle and left part of the abdomen.

HEAD. — Two small spoons full of very transparent serum in the superior cavity of the *arachnoid*; sub-arachnoid infiltration moderate; arachnoid dim or opaque in a great many points of the convexity of the brain. *Pia mater* slightly injected, veins distended with blood; cortical substance natural; medullary moderately injected; both of a good consistence; three or four spoons full of clear serum in each of the lateral ventricles; twice as much of the same liquid in the inferior occipital fossæ. *Cerebellum*, *pons varolii*, and *medulla oblongata* natural.

NECK. — *Pharynx* and *tonsils* of a dull red, in other respects natural; *epiglottis* natural; *trachea* of a brown red in its membranous portion, the mucous membrane less firm here than elsewhere; the

bronchia of a nearly similar color, though less deep, containing a small quantity of mucus.

CHEST. — Slight yellowish infiltration of the cellular tissue in front of the *heart*, a spoonful of yellow and clear serum in the pericardium ; *heart* of a moderate size, firm, perfectly natural, containing a small quantity of liquid blood without any fibrinous clots ; its auricles of a small size, as in the other cases. The *aorta* contained a great quantity of liquid blood in its thoracic portion ; of a light unequal orange red in this part, much less so elsewhere. Its lining membrane perfectly natural ; cellular adhesion of the size of the hand to the left lung ; the right perfectly free. Two spoons full of red serum in the two pleural cavities. *Lungs* heavy, voluminous, blackish, unequally hard posteriorly, where something like partitions could be felt. They both presented a similar disposition internally. The left deeply incised from the summit to the base, presented in this last point a tumor of about two inches in diameter, of the color of muscle, resembling internally the thyroid gland, homogeneous, not sensibly granulated, in which some orifices of small vessels, and infrequent small cellular lines were seen. This tumor, continuous with the pulmonary parenchyma without a distinct line of demarcation, was at least one half firmer than that parenchyma when in the first degree of hepatization. Twenty

other similar tumors existed in the same lobe, some of them of a much deeper color, less consistent, easily penetrated, and reduced into pulp by a slight pressure. The pulmonary parenchyma between them was blackish, homogeneous, not granulated, less firm than the healthy lung, and almost as friable as the hepatized lung. The superior lobe was almost natural through a great part of its extent.

ABDOMEN. — No effusion. The *æsofagus* contained a small quantity of red liquid. Its mucous membrane was almost entirely deprived of epidermis in its superior half, covered by it inferiorly; in other respects natural. The *stomach* was of a moderate size, and contained from ten to twelve ounces of a moderately thick liquid of a very dark red color, homogeneous, without the smallest quantity of clotted blood. Its mucous membrane was whitish near the pylorus, of a more or less deep onion parings color, and slightly mamelonated in a part of its extent about the great curvature and the great cul-de-sac, with some digital depressions, opposite which it had become thin. Elsewhere it had its usual thickness. Its consistence was good, and we obtained strips of it from four to five lines in length in the great cul-de-sac, of from six to seven along the great curvature and the anterior face of the stomach, except in some points, where the strips were from three to four lines and even less. The *duode-*



*num* presented nothing remarkable, its mucous membrane and its crypts were in every respect natural. The *small intestine* contained a considerable quantity of blackish mucus; its mucous membrane was of a clear red in some points of the ileum, livid in its last five feet; the *valvulæ conniventes* were of a light rose tint in its first half. The thickness of the mucous membrane was natural, its consistence diminished, and we could obtain strips of from two to four lines only in the *jejunum*, and of a less length as we went down towards the *cæcum*, near which its consistence was that of mucus. The *large intestine* contained a reddish and brownish matter homogeneous, pultaceous; its mucous membrane was generally greyish, presented some dark red spots in the left colon, was a little thickened in corresponding points, where it was only of half its usual consistence. The *liver* was larger than usual, of an olive tint externally. Its consistence was good, though the finger penetrated it a little more easily than usual. There were only a few red points in the interior of its great lobe; the same was true of the left lobe which was yellowish and a little firmer. The *biliary ducts* were natural; the *gall bladder* was of a considerable size, contained a deep red bitter fluid, and two small and very soft clots of blood; its lining membrane was of its usual aspect, of a blackish red in a third part of its extent,



and a little less consistent here than elsewhere, so as to give strips of from eight to ten lines. We found enlarged lymphatic glands about the biliary ducts, and there were twenty of them of the color of a hazel nut in the mesentery. The *spleen* was small, greyish, shrivelled ; the other viscera natural.

If we are to consider the tumors, an account of which I am giving, as the result of an exhalation of blood in the pulmonary parenchyma, those found in this last subject, the aspect of which was that of the thyroid gland, and the color that of the voluntary muscles, would seem at first sight something very different, a more organized part. Yet their origin was probably the same, and we can readily believe that soon after their formation they assumed the organization and the aspect which has been described.

But, however it may be with these conjectures, it is worthy of remark, that if we find occasionally this kind of black spots in the lungs of those who have died of the most common acute diseases of Paris, still they are much less frequently met with there, than in the victims of the yellow fever of Gibraltar. Nor are such appearances found with us, at least I have never seen any like those which were presented by this last subject ; so that there would seem to be here something characteristic of, or peculiar to, the yellow fever. This circumstance ought not to surprise us, in as much as this disease is accompa-

nied by a disposition to hemorrhage, and a hemorrhage, that we do not observe elsewhere. \*

The other lesions found in the subject of this seventh observation are nearly the same with those which have been presented to us in the other cases, viz. a certain quantity of blood in the stomach and intestine, the mucous membrane of the first of these viscera slightly red and mamelonated, the liver more or less yellow. And we must admit that these lesions explain but imperfectly the fatal termination of the disease. One lesion only was presented by this subject which we have not found in the other cases, I refer to the hemorrhage of the gall bladder.

The last lesion pointed out by me, hepatization, was found in one case only, and then occupied a space as large as a hen's egg.

Thus, as the exhalation of blood in the pulmonary tissue was frequent, the inflammation of that tissue was rare in subjects who had died of yellow fever; the reverse of what we observe in the acute diseases of Paris, where the partial inflammation of the lungs is as common, as the exhalation of blood in their parenchyma is rare.

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\* Since the illustrious Laennec has regarded these hemorrhagic masses as the cause and anatomical character of severe hemoptysis, I would remark that in no one of the six cases where these masses were found, was there any hemoptysis, nor, with hardly two exceptions, have I ever observed any under these circumstances.

## ARTICLE III.

## PLEURÆ.

The pleuræ were remarkable only for the absence of recent lesions of any importance.

We found cellular adhesions between the pulmonary and costal pleuræ in seven subjects, partial usually, in a very slight extent in five, universal but limited to one lung in two others ; the same proportion which has been observed in France amongst individuals who have died at the same period of life.

There were one or two spoons full of serum, usually of a lemon color, in one of the pleural cavities in five subjects ; in a sixth, each pleural cavity contained six ounces of a red liquid without any clot, (23). The lungs of this subject were heavy, and almost without air in their posterior parts, having lost their elasticity without being splenified or hepatised, and presented no trace of those hemorrhagic masses which were described in the preceding article.

The only remark to be made on the subject of the effusion of serum is, that it was less considerable, and was found in a smaller proportion of the subjects, who were carried off by the yellow fever of Gibraltar, than of those who died of the acute diseases of Paris.

We must undoubtedly attribute this in part to the difference in the duration of the diseases and of the agonies.

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## CHAPTER IV.

ORGANS OF CIRCULATION — PERICARDIUM ; HEART ; AORTA.

### ARTICLE I.

#### PERICARDIUM.

If we except the effusion of one or two spoons full of yellowish serum in seven subjects, the pericardium was natural in all those we have opened.

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### ARTICLE II.

#### HEART.

The size of the heart was not remarkable, except in three cases, where it was smaller than common, and in two others, where its dimensions were unusually great. In one of these cases there were at the same time hypertrophy of the left, and dilatation of the right ventricles.

The consistence of the heart was altered, it was

flabby in seven subjects, and at least as many times its cohesion was diminished. The flaccidity of the heart without diminution of the cohesion was found in one subject, who was examined the day of, and twelve hours after, his death; so that we can scarcely attribute it to a commencement of decomposition, or at any rate if the decomposition had commenced, it was not the sole cause.

In two subjects the heart contained no blood; a greater or less quantity of it was found in others, either liquid only, or liquid and clotted; the clots were black or yellow, fibrinous. This last condition was more frequent in the left than in the right cavities.

We found the ventricle and its lining membrane of a bright red color in three subjects, whose hearts were flaccid.

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### ARTICLE III.

#### AORTA.

The aorta contained a greater or less quantity of clotted or liquid blood in all the subjects; and its internal surface was rose or red in six of them, either in its whole length, or, as was more commonly the case, in a part only. The redness was not continuous in all these cases. This color was com-

municated to the middle coat in subjects who were opened twelve, nineteen, twenty-six hours after death. This was evidently the result of imbibition. Whether this imbibition commenced a little before or not till after death, is a point we cannot fully decide; infiltration, which may be compared to the phenomenon we are now discussing, taking place sometimes on the anterior surface of the body several hours and even several days before the fatal termination. We may remark, however, that the red color of the aorta was not found in three subjects, who were examined five, six and ten hours after death. This would seem to shew that the imbibition did not take place not only till after, but even not until some hours after, death.

The redness of the aorta in subjects who have died of yellow fever, is not in other respects remarkable, inasmuch as it is observed, and even more frequently, in Paris after all kinds of acute diseases.

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## CHAPTER V.

## DIGESTIVE APPARATUS.

PHARYNX, TONSILS ; STOMACH ; DUODENUM ; SMALL INTESTINE ;  
LARGE INTESTINE.

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## ARTICLE I.

## PHARYNX AND TONSILS.

The pharynx was natural in six subjects, (17, 16, 19, 22, 23), the mucous membrane more or less red in others ; and with one exception, where it was greenish, it preserved its natural consistence and thickness.

The tonsils presented the same appearances with the mucous membrane of the pharynx, being red or pale in the same subjects ; their size was considerably increased, an inch long in one case in which their depressions were lined by a false membrane and presenting nothing else that was remarkable.

It is then true of individuals, who were carried off by the yellow fever of Gibraltar, that the pharynx and back part of the mouth were still more fre-



quently natural in them, than in those who die of the acute diseases of Paris, not excepting typhoid fever, in the course of which these lesions of the pharynx are not rare.

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## ARTICLE II.

### ŒSOPHAGUS.

The Œsophagus contained a certain quantity of liquid in three cases, red or ruddy in two, black like that of the stomach in another.

The epidermis, which covers the mucous membrane in the natural state, had completely disappeared in its whole length in six of the twenty subjects in whom the œsophagus has been described, (2, 3, 9, 10, 15, 16), it was partially wanting in nine others, and was perfect in five only.

The mucous membrane was blackish, or of a deep brown, in six cases, red, color of onion parings, or reddish brown in three others ; of a proper thickness and consistence in all.

The black color was found only in cases where the epidermis was destroyed in the whole length or in a part of the length of the œsophagus ; shewing that it was the result of a contact more or less prolonged with the black matter at the time of the vomiting or after death.

Was there any connexion between this absence of the epidermis of the œsophagus, and the burning sensation experienced in the direction of that membranous tube, by some patients whose histories we have not collected?

This destruction of the epidermis of the œsophagus, being found in many subjects who have died of other acute diseases, is not peculiar to those carried off by yellow fever. The ulcerations which are not unfrequently met with in those who have died of typhoid fever, were never seen by me in the yellow fever patients whom I have examined.

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### ARTICLE III.

#### STOMACH.

Volume; Contents; Color; Consistence; Thickness; Mamelonated state and Ulceration of its Mucous Membrane.

##### I. VOLUME OF THE STOMACH.

The size of the stomach was greater than usual in seven subjects, in three of whom (18, 21, 22) it was of double its usual size. But was this an effect of the disease? We cannot believe so, for the disease of these individuals was not longer than that of others, nor were their vomitings oftener repeated. The contrary condition, the diminution of the size

of the stomach, was found in three subjects who were apparently in the same circumstances as the others.

Since the size of the stomach is not less variable in individuals who die of other acute diseases, this variation in the cases of yellow fever cannot be peculiar to that disorder.

## II. CONTENTS OF THE STOMACH.

The contents of the stomach were not the same in all subjects. There was a small quantity of flocculent mucus in one, a little greyish liquid in another, some yellowish matter in a third, (13), a liquid of the same color, depositing on standing a little black matter, in a fifth; in others, eighteen in number, the contents of the stomach were red more or less inclining to black. They were red in five cases, (2, 8, 10, 15, 23).

The more or less rapid progress of the disease had little appreciable influence on the intensity of the color of the liquid we are now considering; the mean duration of the disorder was the same in the two orders of cases; and a great deal of black matter was found in the stomach of one of the subjects whose disease was the most rapidly mortal, he having died three days after its commencement, (5).

The red or black matter varied in quantity from four to twenty ounces, and the deeper its color the

more abundant it was, so that in the cases where it was of a bright red color, the mean quantity was nine ounces, while there were fourteen ounces in the cases where the matter was entirely black.

The red matter was not usually less thick than the black, which presented several degrees of consistence, having that of porridge in a great many cases, and being very liquid in others. It separated on standing into two parts; the one superior more liquid, of a bistre color, the other inferior less abundant and, as it were, formed of blackish parcels.

This black matter was not mixed with clots of blood in any case; and we found them in the stomach once only in a subject in whom this organ contained a red liquid. Nevertheless, we can hardly doubt that this black matter, when homogeneous, thick, and as it were pultaceous, was at least in part composed of blood; the vessel in which it was kept, and the bodies plunged in it, being stained red. But what was the mechanism of its formation? We find no vessel ruptured in the whole length of the alimentary canal, so that we must consider it a product of the exhalation of the gastric mucous membrane, although there was no especial lesion of this membrane to explain it. Leaving the confirmation of this assertion to the testimony of facts, I shall give here the anatomical history of a child from six to ten years of age, who died of the

yellow fever in the Civil Hospital of Gibraltar, after an illness of about five days. We did not observe him during life, his stomach contained a certain quantity of black matter, but there was no appreciable alteration of its mucous membrane.

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#### EIGHTH OBSERVATION.

*Autopsy the second of December twelve hours after death.*

EXTERIOR. — Numerous blackish spots. A marked yellow tint. Cadaverous rigidity well marked. Muscular prominences more evident than is usual at this age.

HEAD. — Slight sub-arachnoid infiltration, three small spoons full of serum in each lateral *ventricle*; *cortical* substance of the *brain* of a bright rose color; the *medullary* substance firm and moderately injected. *Cerebellum* softer than the *brain*; in other respects its aspect the same.

SPINE. — Three small spoons full of serum in the lower part of the *arachnoid*. *Spinal marrow* natural.

NECK. — *Pharynx* redder than natural. Cervical *glands* of a bright red, of a good consistence and of quadruple their usual size.

CHEST. — The *heart* perfectly natural. A fibrous yellow clot easily torn in the *left ventricle*. The *large vessels* contained a black and liquid blood, but their color internally was natural. The *lungs* were natural, the *left* adhered to the costal pleura by universal cellular ties.

ABDOMEN. — The *œsophagus* was deprived of its epidermis. The *stomach* was of its natural size and contained about four ounces of a thin liquid of the color of burnt coffee, leaving a mahogany tint on the sides of the vessel which had contained it. We found on the mucous membrane reddish bands having different directions, two lines in width, but here, as elsewhere, its consistence and thickness were natural. The *small intestine* was of its usual size, it contained mucosities of the consistence of thick custard, imperfectly mixed with a dark olive matter. Its mucous membrane was injected in some points, and we obtained strips of from three to five lines in the *jejunum*, of from five to eight through the rest of its extent, except near the cæcum for the length of a foot, where its strips were only of three lines. The last *patches of Peyer* were nearly a third of a line in thickness, of a pale rose tint, the cellular tissue was not otherwise remarkable. Brunner's glands were somewhat developed, and of a more lustreless white than the surrounding mucous membrane. The large



intestine contained in its first half a pultaceous matter of an olive color; a more consistent and deeper colored matter in its second half. Its mucous membrane was of the color of onion parings. Its strips in the first half were from three to six lines, from two to four lines in the second half, and the subjacent cellular tissue was slightly infiltrated. The mesenteric *glands* corresponding to the last part of the ileum were, like the cervical, of a bright rose color, of a good consistence, and of four times their usual size. The *liver* was flaccid, its cohesion natural, its left lobe, and the left half of the great lobe, of a straw yellow color; the other half had a slight rose tint. The *biliary ducts*, the *gall-bladder* and the bile contained in it, were natural. The *spleen* was of quadruple its usual size, but not remarkable in other respects. (The child was born at Mahon where intermittent fevers are endemic.) The *kidneys* were yellowish in their whole thickness, and the *bladder* of a similar color.

As we have said, there was really no alteration of the mucous membrane of the stomach; for the reddish bands which traversed it in different directions, were probably only a cadaverous phenomenon, as the purplish color of the lateral and posterior parts of the trunk in subjects who have been left on their backs during a certain space of time. Besides, the



consistence and the color of the membrane was natural, nor was there any mamelonated appearance, such as is so frequently observed, and which we found in all the subjects of our preceding observations. And to explain the presence of the black matter in the stomach, which must be regarded as a product of exhalation, we must here, as we have already done for other phenomena, admit the existence of a specific cause, probably the same with that of the yellow fever itself. And, as in the other cases, it is quite impossible to explain the death of the subject by the condition of the organs. The lesions which we found were a slight inflammation of some of the cervical and mesenteric glands, an inconsiderable tumefaction of some of Peyer's glands, a diminution of the consistence of the mucous membrane of the colon, and the alteration of the liver. And this last is so much the more remarkable, inasmuch as the other cases presented the same lesion ; and as this lesion is the only one which was found in them all, we may naturally conclude that it is of more importance as an anatomical character than the others.

The slight tumefaction of the last of Peyer's patches was too little marked to be entitled to any especial attention, and in the inflammation of the cervical and mesenteric glands we can see only an accessory or secondary lesion, more or less connect-

ed with the febrile symptoms, as we shall see more clearly hereafter. The presence of the red or black matter in the stomach, seldom found in the course of other acute diseases, is to be regarded as an anatomical characteristic of the yellow fever, though not essential, inasmuch as it is not found in all cases. As to the period in which the formation of this black matter takes place, that it may be sometime after the commencement, and even after the disappearance of the symptoms of the disease, would seem evident from the following observation.

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#### NINTH OBSERVATION.

Boyd, a soldier of the forty-third regiment, æt. 43, tall, of a strong constitution, was brought to the Marine Hospital the 24th of November. He had been in garrison in the American colonies, said that he had had the yellow fever in Barbadoes, he has been several years in Gibraltar, and has not mounted guard in the city since the 6th of September, when his regiment was in camp on the Europa Flat. He had been on guard out of the camp three times only since that period. There had been no sick persons in his tent, but several men of his company had lost their health within a few days. His illness

commenced the 23d of November, by a marked diminution of the appetite; the morning of the 24th, he had a chill, shivering, lasting a half hour, and followed by great heat, violent pain in the calves of the legs, pains in the abdomen, vomitings.

We saw the patient at two o'clock as he entered the hospital. His intellectual faculties were perfect, he was calm, complained of violent pain in the calves of his legs, less headache than at the commencement, the tongue almost natural, the pulse slightly accelerated, large; the heat moderate; the abdomen indolent; the eyes not remarkable; no anxiety.

After our departure the heat became very great; towards nine o'clock in the evening, the patient had discharges from his bowels, after having taken an ounce of salts in some sweetened water, and was in a copious perspiration during the night. The chills were repeated four times, and the pain in the calves of the legs continued.

The 25th, at nine o'clock, the pain the same, the countenance calm, the eyes scarcely moist, not injected. The patient sat up in bed with difficulty, as well on account of his weakness as his pain; there was no strength in his hands; the middle part of the tongue whitish, its edges red, moderately moist; the abdomen indolent, its form natural; the pulse very unequal, very irregular, one hundred and fifteen; the

skin injected, the perspiration abundant ; the heat moderate ; the beats of the heart feeble, occasionally intermittent.

Cream of tartar water ; three grains of calomel every three hours ; gruel.

The headache diminished, there were slight chills at noon and at four o'clock in the afternoon, not followed by heat, and the patient was comfortable until four o'clock in the morning, when he was again seized with chills, followed by heat and sweat. The urine abundant ; six watery stools without blood. The 26th, at ten o'clock in the morning, prostration, but no stupor ; the face moderately colored, slightly injected ; slight headache and pain in the limbs ; pulse feeble, regular, large, one hundred and four ; sweat copious ; injection limited to the integuments of the chest, no yellowness ; tongue thickened, greenish, moderately moist ; gums a little swollen ; painful sensation at the epigastrium ; no alteration of the intellectual faculties.

Calomel as yesterday ; twenty-four leeches to the epigastrium ; mucilaginous drinks, warm bath in the afternoon ; oil enema.

At four o'clock in the afternoon, violent chills, followed by heat and perspiration. The patient scarcely slept, there was neither nausea nor vomiting, and the pains in the epigastrium subsided, as the leeches fell off.

The 27th, the patient was calm, the prostration less ; no redness of the eyes ; no pain in the limbs ; no headache ; moderate thirst ; abdomen indolent, with a slight yellowish tint ; the other symptoms as on the preceding day.

The prescription of yesterday except the leeches.

There was no chill in the course of the day. The 28th, the debility was increased, the patient could not leave his bed, nor so much as close his hand ; the tongue brownish, a commencement of salivation ; the mouth hot ; the urine lemon-colored, passed with more difficulty than usual. (The patient had a stricture of the urethra.) Six dejections, the faecal matter yellowish ; no nausea, no vomiting. The calomel was suspended. The catheter was used, and the next day the condition of the patient had not changed. He had no pain.

The 30th, he remained in the same condition ; he complained only that he could not sleep, and attributed his inability to sleep to the salivation, which was really considerable. He had six stools after the administration of a small quantity of castor oil. The urine was passed with difficulty, leeches were applied to the perineum during the day ; during the night he was hot and restless. Two stools followed the enema.

The 1st of December, the dysury continued ; the pulse eighty-four, the heat natural ; the chest

slightly injected ; great weakness and prostration ; the countenance indicative of surprise ; answers slow as usual ; deglutition easy ; no nausea, no vomiting.

Leeches to the perineum ; a potion containing the sweet spirits of nitre.

The urine was passed with difficulty, and the patient perspired profusely during the night.

The 2d, the mind, countenance, and attitude, natural ; the pulse moderately large and strong, ninety-six ; the heat almost natural ; the salivation less than on the preceding days. The patient had taken a little tea and bread, and had not suffered. The 3d, the pulse was eighty, large and regular, the heat and the other symptoms as the day before. The urine was copious, and passed without the use of a catheter ; constipation. Boyd was regarded as convalescent. Pills of coloquinth were prescribed, and he was allowed to take a little *bouillon*.

The 4th, the face was less natural, the debility greater ; the patient was uneasy ; the dejections were numerous ; the pulse, seventy ; the respiration at times accompanied with sighs. A large and painful tumefaction of the left buttock was discovered. The salivation inconsiderable.

Poultice.

The buttock was red and larger than the day before, but no fluctuation could be discovered in it. The



urine passed with great difficulty ; the anorexy complete ; the pulse one hundred, neither large nor small, moderately resisting. The 6th, an incision was made at the root of the urethra ; a great quantity of urine escaped, and soon after, the left buttock was much less swollen than on the day before. The patient was greatly relieved, his countenance good. A catheter was allowed to remain in the bladder. In the following days the suppuration was abundant ; severe symptoms came on, and the patient died the 10th of December, not having been troubled during his last hours with nausea or vomiting, and to a slight degree only, with hiccough.

*Autopsy.*

EXTERIOR. — Universal yellow color ; deeper on the chest and above than below ; *muscles* well marked, of a good color. The *penis*, *scrotum* and *perineum*, swollen, emphysematous.

The *brain* and *spinal marrow* were not examined.

NECK. — The *pharynx* presented nothing remarkable. The mucous membrane of the *æ sophagus* was natural, and covered by its epidermis.

CHEST. — *Heart* natural, containing no blood. *Aorta* of a deep yellow, containing a little black and liquid blood. The left *lung* adhered in parts to the



pleura, the right being perfectly free. Both lungs soft and torn with difficulty.

ABDOMEN. — The *stomach* of considerable size, contained about eight ounces of a black fluid, which, after standing a short time, deposited a sediment like soot and water. Its mucous membrane was of a yellowish grey, except in some patches near the cardia and pylorus, where it was of a bright rose color, which, apparently, was owing to an injection of its villousities. The mucous membrane was not mamelonated, and preserved its usual thickness and consistence. That of the *duodenum* was slightly softened, and some of its folds were red. A black matter, a little thicker than that in the stomach, was found throughout the *jejunum*, and in the first half of the *ileum*; further on there was only a more or less viscous mucus. The mucous membrane of this part was greenish, and soft like mucus. In other parts, it was of a yellowish grey color, and gave strips of from three to five lines. The *mesenteric glands* were natural. The *large intestine* was taken away before it could be examined.

The size, cohesion, and firmness of the *liver* were natural; its right lobe was of a uniform dark red; the yellow color predominated in the left lobe, which was spotted with red points. The *gall bladder* contained half an ounce of green bile, and its mucous membrane, like that of the biliary ducts, was per-

fectly natural. The *spleen* was somewhat softened, of a proper size. The *kidneys* natural. The *bladder* contained about four pounds of a yellow and cloudy urine. There was a stricture of the *urethra* just before its membranous portion, and behind the prostate.

That this disease was the yellow fever, appears to me to be shewn by the pains at the epigastrium, the vomitings, the prompt appearance of the yellow color, the state of the liver coinciding so well with what we have previously observed, the presence of black matter in the stomach and small intestine, and the absence of other lesions capable of explaining the symptoms which occurred anterior to the rupture of the urethra, and characteristic of a different disorder. Boyd died at a much later period than that at which the convalescence of yellow fever patients usually takes place, so that the black matter found in the stomach and small intestines was the product of an exhalation posterior to the cessation of the phenomena which belong to the epidemic of Gibraltar.

The almost perfect integrity of the mucous membrane of the stomach, confirms what has been said of the impossibility of attributing the formation of the black matter to any appreciable lesion of that membrane.

## SEC. III. — MUCOUS MEMBRANE OF THE STOMACH.

Color ; Consistence ; Thickness ; Mamelonated appearance ;  
Ulceration.

The color of the mucous membrane was not the same in all the cases, and it varied in the same case in different points of the surface. In one case it was universally red, except near the pylorus (23) ; in five others through a more or less considerable part of its surface ; in some in the great cul-de-sac, (10, 20), in the superior half ; and on the anterior and posterior faces in three subjects, (Obs. 14, 19, 22). Instead of a red color, there was an orange, or a slight rose tint, or a color of onion parings, in a varying extent, in eight others, (Obs. 1, 2, 3, 4, 5, 8, 22, 24). We found a ruddy or bistre hue in two cases, (7, 15) ; a greenish or yellowish color in two others. The color of the gastric mucous membrane was natural in three subjects only.

These alterations of color were independent of the contents of the stomach, at least in the majority of cases, and were owing, as we shall soon see, to a very frequent lesion of the mucous membrane. In other respects there was nothing remarkable about them, inasmuch as they are observed almost as frequently in subjects who die of the acute diseases of Paris. The *thickness* of the mucous membrane of

the stomach was natural in half the cases, among which we count two, where in parts this membrane had become thin, (8, 10). In the other cases it was thickened. A thin state of the mucous membrane was not universal in any subject, but was found in long, narrow and red bands on the anterior and posterior faces of the stomach in two cases, in digital depressions in a third case ; in a fourth case through the whole of the great cul-de-sac. In the two last cases the mucous membrane was thickened in a great part of its extent.

A universal thickening of the membrane was found in two cases ; in two others this thickening did not extend to the great cul-de-sac ; in two others it was limited to the anterior face, in a seventh to its inferior half, and in three others to the neighborhood of the great curvature, or of the pylorus. This alteration was found equally, in cases where the size of the stomach was increased, and in cases where it remained of its natural size, so we cannot consider it as the result of a mechanical action. Nor can we be suspected of error, for in the greater part of the cases we have estimated the thickness exactly in linear measures ; and in other cases the relative proportion of the thickness of the different parts of the membrane was disturbed, the membrane in parts near the small, being thicker than in parts near the great, curvature. This thickening which was, as

we shall soon see, the effect of inflammation, is less frequent in subjects dying of the acute diseases of Paris, and on this account is the more worthy of our attention.

The consistence of the gastric mucous membrane was natural in two subjects, that is to say, it gave us strips of from three to four lines in the great cul-de-sac, from six to eight along the great curvature, and from nine to twelve on the anterior face of the stomach and in the neighborhood of the pylorus (3, 5, 7, 9, 10, 11, 15, 18, 21, 24). The same was true of three other cases, except in the region last mentioned. In ten other cases, the mucous membrane of the stomach was more or less softened. The softening was general, but moderate, in five of them, partial and but rarely to a remarkable degree in the others, so that in no region, not even in the great cul-de-sac, was the mucous membrane reduced to the consistence of mucus. We observe this often in subjects who have died of other acute diseases.

The softening which we are now studying, was evidently the result of inflammation in the greater number of cases. In seven of them there were besides, thickening and redness. It was the same, undoubtedly, in an eighth case, where the softened membrane was greyish and thickened; in two others this membrane was only greyish or rose

colored, without manifest thickening. And if we cannot assert positively that there was no inflammation here, its existence is to be considered by no means improbable.

This softening is hardly less frequent after other acute diseases, but what makes it most important in these cases, is the rapidity with which it took place. The disease was short, and the gastric mucous membrane was not affected in all the cases at the commencement of the fever, or, at any rate, according to all appearances it was not.

The mamelonated appearance, and usually to a remarkable degree, was found in fifteen subjects, or in about two thirds of the cases. In two cases it was general, in two others it was found every where except in the cardiac and pyloric regions, it occupied the third, half, or the fourth part of the surface of the stomach in the rest of the cases, and in all these the color of the mucous membrane was altered, red or orange in ten, of the color of onion parings, ruddy or greyish, in the others.

In all these cases the mucous membrane, which was the seat of this mamelonated appearance, was softened or thickened, or both softened and thickened, so that the appearance must be considered as the product of inflammation.

This mamelonated state is less frequently found in subjects who die of other acute diseases, and for



this reason it ought to occupy a more important place in the history of the yellow fever of Gibraltar.

Ulcerations were found in two cases (18, 21.) In one they were thirty in number, of the size of a pin's head, and on the anterior face of the stomach. The mucous membrane was at the same time of an orange red, softened, and evidently thickened. On the contrary, it was of a natural consistence and thickness in the other case, where there were but five ulcerations, and these superficial.

These ulcerations were not remarkable in other respects, for they are observed in about the same proportion in subjects who die of other acute diseases.

Since all the lesions which we have just passed in review are found in different proportions in subjects who die of other acute diseases, it follows, as I have already shewn, that the cause of the formation of the *black vomit* must be sought elsewhere ; perhaps in the blood, and perhaps it is the same with that of the disease.

Finally, the mucous membrane of the stomach had its natural thickness, consistence and aspect, was not mamelonated, and presented only slight alterations of color in five cases (10, 11, 15, 17, 24.) Some of these alterations were anterior to the yellow fever, some of them must be considered as cadaverous phenomena, so that in five cases, or about one fifth



of all the cases, the gastric mucous membrane may be considered healthy. And as it was not altered in all the cases, as its lesion is not inseparable from the disease, it follows that the yellow fever of Gibraltar, of 1828, is not a gastritis, that the different lesions of the gastric mucous membrane are secondary or accessory, and that in cases where they were found, they were probably developed at a certain period after the commencement of the disease. And here, too, we may again remark, that the inflammation of the mucous membrane of the stomach in the cases where it was found, was never intense, since this membrane was never very red, nor very much softened. All that we can conclude from these facts relative to the gastritis is, that the yellow fever of Gibraltar, of 1828, had a particular influence in its developement, since it was more frequent, and came on nearer the commencement of the principal disease, with which, in some cases, it would appear to be confounded, than in any other acute affection.

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## ARTICLE IV.

## DUODENUM.

The duodenum, which was not remarkable for its size, contained ordinarily a matter like that found in the neighboring part of the jejunum. And although mention has not been made of it in the history of all the patients, I can affirm that it was similar in nearly every case, and I merely announce the fact, because I wish to avoid the repetition of what will soon be said relatively to the jejunum.

As to the mucous membrane of the duodenum, it had a red color more or less deep in the valvular part, or through its whole length, in a little more than half of the individuals, or in nine of the fifteen cases where it has been described; an orange tint in two subjects, greyish in two others, so that it was white, and had its natural aspect in three cases only. Its thickness varied from the natural state in one case, where it was slightly augmented; and here it was uniformly red without being manifestly softened, giving on traction strips of from three to four lines.

Its consistence was natural in eight cases (1, 3, 5, 10, 17, 21, 24, 25), diminished in the others, sometimes so as to give strips of one line only (7, 15). In no case was it reduced to the consistence of mucus, and since softening and thickening existed

together in one case only, the softening of the mucous membrane of the duodenum cannot be considered inflammatory except in a small number of subjects.

The crypts of the pyloric valvular portion were more developed than natural in two cases, which were not remarkable in other respects.

The different lesions which have just been enumerated, are found in subjects who die of different acute diseases, so that nothing in the duodenum of the subjects whom we have examined, can furnish an anatomical character of the yellow fever, or explain the remarkable state of the liver, to which I shall soon call attention in a special manner.

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## ARTICLE V.

### SMALL INTESTINE.

Volume ; Contents ; Color ; Consistence ; Thickness of the Mucous Membrane ; Peyer's Glands.

#### SEC. I.—VOLUME OF SMALL INTESTINE.

The size of the small intestine was not remarkable, if we except two cases, in which it was increased in consequence of the developement of foetid gas.

In another case it was diminished through the whole length of the ileum.

SEC. II.—CONTENTS OF THE SMALL INTESTINE.

As was the case with those of the stomach, these contents were not always the same. In one case (Obs. 18), the intestine contained a yellowish liquid; a more or less viscous and abundant liquid in five others; a reddish, brownish, blackish, or even entirely black matter in fifteen subjects; and blood recognizable by all its external characters in a seventeenth (15).

The black or blackish matter, was found throughout the whole length of the intestine in three cases, it was limited to the jejunum in seven cases, to the ileum in an eighth case, where its color was greater, and its consistence more considerable than that of the black matter of the stomach, and increasing the farther we found the matter from this last organ.

From this last fact, we can easily believe that the stomach is the source of the black matter, and we believe it the more easily, when we consider this other fact, that in almost all the cases where this matter was limited to a part of the small intestine, it was found only in the jejunum.

However, admitting that such was the usual origin of the red or black matter of the intestine, it would

seem that this was not the only source of it, and that in some cases it was the product of exhalation from the intestinal mucous membrane itself, since a certain quantity of it was found in the small intestines of two subjects, in whose stomachs there was neither red nor black matter. One of these subjects never having vomited, we can hardly suppose that the black matter exhaled in the stomach had entirely passed into the intestine. The absence of any lesion of the mucous membrane of the intestine would be no objection to this view, no lesion having been found in the stomach; and we shall see in the third part of this work, where we discuss the state of the abdomen, that this induction is well supported.

The following fact relative to a soldier of the ninety-fourth regiment, the history of whose symptoms we have not collected, is an instance of a case where the black matter of the intestine was the most abundant and the thickest.

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#### TENTH OBSERVATION.

*Autopsy thirteen hours after death.*

EXTERIOR. — Universal and moderately intense yellow color; black liquid dried about the mouth; muscular prominences very marked, as during life

(the man was a pugilist); *embonpoint* moderate; muscles of a good color.

HEAD. — *Dura mater* of a delicate yellow color; hardly any traces of *sub-arachnoid* infiltration; cerebral *veins* small; *pia mater* not injected; *cortical* substance pale; *medullary* substance dotted with blood; both of a good consistence; a small quantity of yellow serum in each lateral ventricle; *cerebellum* natural; *pons varolii*, *medulla oblongata*, small.

SPINE. — A little serum in the lower part of the *arachnoid*; *spinal marrow* natural.

NECK. — *Pharynx*, *velum* and *tonsils*, red, color of onion parings, moderately deep, its mucous membrane in other respects natural; the color of upper part of *trachea* nearly the same, but fainter.

CHEST. — Two spoons full of lemon colored serum in the *pericardium*; *heart* of a moderate size, containing a little liquid blood and no clots; *aorta* yellowish internally, of a very slight pale rose tint in some points, containing a moderate quantity of liquid blood. The *lungs* natural anteriorly, heavy and of a deep red behind, crepitating, containing but little air, neither splenified nor hepatized. No effusion in the *pleural* cavities.

ABDOMEN. — No effusion; *æsophagus* of a moderate size, containing a little reddish and brownish liquid; its mucous membrane was of the color of onion parings, of a proper thickness and consistence,

deprived of its epidermis, except at the extremities, where were to be seen some vertical bands from two to three lines wide. The *stomach* was of its usual size, contained about twelve ounces of a deep red brown fluid, without clots of blood, staining red the bodies plunged in it. Its mucous membrane was of a clear brown red, or mahogany color, in its great cul-de-sac, bistre with a shade of green elsewhere, slightly mamelonated in the half of its extent, and in the great cul-de-sac more than elsewhere. It was of proper thickness, except in some digital depressions, where it was only two thirds as thick as in surrounding parts. Its consistence was generally good, so that it gave strips of from two to five lines in the great cul-de-sac, of from five to eight along the great curvature, and of from three to four near the pylorus, where it was easily torn.

The *duodenum* was of its natural color, its crypts were slightly developed, and its mucous membrane perfectly natural. The *small intestine* contained a black matter of the consistence of viscous mucus or of something intermediate between a pultaceous and a pulpy matter through its whole length, thicker as it was nearer the cæcum. The mucous membrane in the last half of the *ileum* was of the color of red onion parings, elsewhere it was of a clear grey, rarely greenish, it was of its natural thickness; its strips were from five to six lines in length in the jejunum,



of four or even less lower down ; the *crypts* of *Brunner* were not to be seen, and the *patches* of *Peyer* natural. The *large intestine* contained a moderate quantity of fœcal matter of a beautiful black color, a part of it pultaceous. Its mucous membrane was of its natural color, of a ruddy tint, a little thicker than usual in its middle third, and its strips were from five to eight lines. The sub-mucous cellular tissue was yellowish and infiltrated in its first half. Some mesenteric glands were larger than usual. The *liver* was of a yellow buff color over its whole external surface, a deeper yellow color internally, approaching to green in the left lobe, orange in the large extremity of the right lobe ; a double tint owing to the mixture of some small green or red points with the uniform yellow color of the two lobes ; it was perhaps a little larger than usual, its consistence, on the contrary less, so that the fingers penetrated it more easily than usual. The *biliary ducts* were perfectly natural, the bile of a deep green color, of a moderate consistence, and the bladder containing it, natural. The *spleen* was of its usual size, of a wine lees color, and had only half its usual consistence. The *kidneys* were firm, of a slight yellowish tint, not remarkable in other respects.

As we have already said, the black matter contained in the small intestine was abundant, and as has

been said in the general description, thicker than that of the stomach, and increasing in thickness towards the ileo-cæcal valve. We can have no doubt of the nature of the disease, whether we consider its rapidity, or the character of the lesions, as the yellowness, the black matter through the whole extent of the alimentary canal, and the condition of the liver ; a condition which we have observed in all the cases where the symptoms left no doubt of the character of the malady during life, and which, as I have already had occasion to observe, is not found in combination with the other lesions in any other disease.

But, to return to the subject of this section, the presence of the black matter in the small intestine in so great a number of subjects, forms an anatomical character, to be sure a secondary one, of the yellow fever of Gibraltar, and distinguishes it from other acute diseases, in the course of which we observe nothing of this kind, or at any rate, not oftener than twice in a thousand cases. And the fluid found in these is by no means identical with that of the yellow fever.

It is proper to remark again, that in those cases where the small intestine contained only mucus, this mucus was in a state very little different from that in which it is found in patients who die of the acute diseases of Paris, of continued fever especially.

For as in typhoid fever subjects, with the mucus of the small intestines there is found a considerable quantity of yellow bile only, so in yellow fever subjects, there usually is no admixture of foreign matter.

SEC. III.—MUCOUS MEMBRANE OF THE SMALL  
INTESTINE.

Color ; Consistence ; Thicknes ; Peyer's glands.

COLOR.—The mucous membrane was slightly injected, or red at intervals, in the last feet of the ileum in ten cases (Obs. 2, 3, 6, 8, 9, 14, 18, 20, 21, 23) ; whitish, yellowish, or ruddy, in the others. The redness, when extensive, was under the form of arborisations, and where continuous, it was limited ; in no case did it occupy the whole length of the intestine.

THICKNESS.—The thickness of the mucous membrane, which we are now considering, was natural, except in one case, where we found it increased at intervals through a part of the extent of the intestine (5), and with the thickening there was a slight redness and a certain degree of softening, that is to say, in this case the mucous membrane was manifestly inflamed in a part of its length.

The infrequency of the thickening of this membrane in yellow fever subjects is not remarkable, inasmuch as this thickening is as rare in those who die of other acute diseases.

CONSISTENCE. — The consistence of the mucous membrane of the small intestine was natural or nearly so in ten cases ; it was slightly diminished through its whole length in three subjects, still more so in three others, to a moderate extent, and in four cases also to a moderate extent, its consistence was that of mucus, (2, 3, 9, 23).

The consistence of the mucous membrane we are studying is not frequently diminished in the course of the acute diseases of Paris.

We can see no connection between the length of time which elapsed between the death and the autopsy, and the consistence of the membrane ; the softening having been sufficiently marked in subjects opened six hours after death, and the consistence having been natural throughout the whole length of the intestine in individuals, the autopsy of whom was made more than twenty-four hours after the fatal termination of the disease.

And if the softening was undoubtedly inflammatory in one of the above cases, it evidently was not so in others, where the mucous membrane was injected without any increase of its natural thickness ; and still more evidently did it have some other cause than inflammation, in cases where it was accompanied neither by redness nor thickening.

## SEC. V. — PEYER'S AND BRUNNER'S GLANDS.

Some of Peyer's patches near the cœcum were slightly tumefied in one of the twenty-three subjects of whose histories we are making an analysis, a child. In all the other cases, they presented no appreciable alteration.

An alteration of Peyer's glands being an anatomical character of typhoid fever, and these glands being natural in individuals who die of yellow fever, we say, that the yellow fever is not a typhoid disease. And if any one should pretend that the rapid termination of the disease was the reason why no alteration of Peyer's glands was observed, in order to maintain the identity of the two maladies, he would be obliged to explain how other severe lesions were developed so rapidly. Why of two similar diseases, is one rapidly fatal, the other often so, not till after the lapse of a considerable time ; why do we observe in individuals dying of yellow fever lesions which are not found in those dying of typhoid fever ? We may add to this, that very marked lesions of Peyer's patches are found in individuals who die the sixth and seventh days of the disease, whilst nothing of this sort exists in those who die of yellow fever, the same length of time having elapsed since its commencement.

## ARTICLE VI.

## LARGE INTESTINE.

Volume ; Contents ; Mucous Membrane.

## SEC. I.—VOLUME.

The size of the large intestine was natural in all but two cases, where it was sensibly increased, a remarkable fact, inasmuch as it establishes a new difference between the yellow fever and the typhoid fever, in which the meteorism of the large intestine is observed in more than half the cases, and often to a considerable degree.

## SEC. II.—CONTENTS OF INTESTINE.

The matters contained in the intestine had a greyish or yellowish or greenish color, a pultaceous consistence in five cases, in fifteen others they were of a more or less livid red, of a wine lees or chocolate color, blackish or black ; and they were found in a variable extent, sometimes through the whole length of the intestine. In two cases they resembled liquid blood, and their appearance was the same in the small intestine. Black or brown, these matters varied in their consistence, and in some subjects they were as firm as common fecal matter.

With one exception, there was no black or brown matter in the large intestine, but in cases where a



greater or less quantity of it was contained in the stomach and small intestine, or at least in one of these. In the case just referred to, there was no black vomit, so that the black matter of the large intestine may be considered in this case the result of the exhalation of the mucous membrane of the colon, and from the facts in this and the preceding articles it would seem to follow, that the mucous membrane of the stomach, that of the small and that of the large intestine, in an undetermined proportion, had given rise to the brown or black matter with which they were in contact.

We see very rarely a red liquid in the colon of subjects who die of the acute diseases of Paris, and a black fluid I have never seen; and as this fluid was found in several of the individuals who died of the yellow fever of Gibraltar, its presence must be regarded as one of the anatomical characters of the disease, but not essential to it, because, not always found.

SEC. III.—MUCOUS MEMBRANE OF THE LARGE  
INTESTINE.

Color ; Thickness ; Consistence ; Ulcerations.

COLOR.—The color of the mucous membrane of the colon was natural in six subjects; a pale or bright red in five others; greyish, or yellowish, more usually greyish, in the rest. The red or rose color



existed in a varying extent in individuals whose large intestine did not contain any red matter, and in cases where it contained a greater or less quantity of it. In these last the tint of the membrane was more or less exactly that of the matter with which it was in contact. Nevertheless, we must not conclude from this coincidence that this color was the effect of imbibition, for this membrane was of a greyish tint, or preserved its usual paleness in individuals whose large intestine contained a certain quantity of red or black matter, and in several of those cases the mucous membrane was softened and perhaps inflamed. In one of them, where there was both softening and thickening, the inflammation was manifest. We should remark also, that this red color did not extend below the mucous membrane in any instance ; another reason for believing that it was not the result of imbibition.

The CONSISTENCE, natural in six cases, was more or less diminished through a variable extent in the others. The softening, universal in fourteen cases, was considerable in six of them, that is to say, this membrane gave strips of from one to five lines in length. In the other cases the softening was less. We should remark also, that in those cases where the softening was most considerable, the autopsy was made five, nine, twelve hours, and in one case only, twenty-two hours after death, so that we cannot

consider putrefaction as the cause of these phenomena. And where there was no alteration of color, the softening cannot be regarded as the effect of inflammation.

THICKNESS. — The thickness of the mucous membrane of the large intestine was not remarkable, except in three cases where it was increased in a part or in the whole of its extent (5, 10, 16), and in these three, a more or less considerable degree of softening was found also, and in two of them a rose color. If in this last we are to consider the thickening as the effect of inflammation, we have by no means the same evidence of the existence of inflammation in other cases, where there was no change of color.

ULCERATION. — Ulcerations were found in two cases. They were very small and on a sort of red bands which were dotted with them, in a case where the death occurred on the fifth day of the disease. In the other case they were larger, a line in diameter, ten in number, and found only in the last quarter of the intestine (5). This subject had been a soldier who had been troubled with diarrhœa six days, when attacked by the epidemic, which probably had nothing to do with the ulcerations, so that we have only one case in which the ulcerations may be regarded as a rare, and more or less remote consequence of the yellow fever.

It results from the facts and analysis of this article, that excepting the black matter, the lesions found in the large intestine of those who died of yellow fever, were the same with those found in individuals dying of other acute diseases, and the only difference is in the relative frequency with which these lesions occur.

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## CHAPTER VI.

### LYMPHATIC GLANDS.

THE lymphatic glands were almost always natural; those of the neck, of the mesentery, and of the biliary apparatus, were the only ones found otherwise.

The mesenteric glands were altered in four cases, and in each of these cases the number of glands not in a natural condition was small. In one case they were larger than usual; red, and of more than twice their ordinary size in the part of the mesentery corresponding to the jejunum in another case (5); in a third, one only was of more than triple its usual size, red, and friable, and here the elliptical patches of Peyer did not present the slightest alteration. In a fourth case where these patches were slightly red and swollen, the corresponding mesenteric glands

were voluminous, of a bright rose color and a proper consistence.

We surely can find little resemblance between this state of the mesenteric glands, and that in which they are found in patients dying of typhoid fever. Nor can we attribute this state to an inflammation of the corresponding mucous membrane, which scarcely existed in any of the cases. We can only refer their condition to that law according to which, wherever severe febrile symptoms, whatever may be the cause of them, continue during a certain number of days, organs not primarily affected, become the seat of alterations more or less important, usually inflammatory. This interpretation of the facts is confirmed on reviewing one case where the cervical glands were red and voluminous, the mesenteric glands being in the same condition, and the mucous membrane of the air passages not presenting a trace of inflammation.

One of the lymphatic glands about the biliary ducts was swollen, red and softened, in a case where this inflammation could not be caused by that of the neighboring mucous membranes.

Similar lesions to these which we have just described, are found in subjects dying of the most common acute diseases. We can then see in them nothing peculiar to the malady we are studying.

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## CHAPTER VII.

## BILIARY ORGANS.

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ARTICLE I.

## LIVER.

Size ; Firmness ; Cohesion ; Color.

THE *size* of the liver was natural except in two cases, where it appeared rather larger than usual.

Its *firmness* was somewhat increased in three cases, diminished in five. The cohesion and the resistance of its tissue to the knife, or to the hand on attempting to break it, was increased in five cases (11, 14, 17, 19, 24), and diminished in five others, and in all these cases, except two, the cohesion was the same through the whole thickness of the organ.

But the most remarkable lesion of the liver, was the alteration of its color, which was more or less exactly the same in all the cases, and through the whole extent of the organ, with three exceptions, of which I shall soon have occasion to speak. This alteration consisted in a discoloration, the liver being sometimes of the color of fresh butter, sometimes of a straw color, sometimes of the color of coffee and

milk, sometimes a yellowish gum color (22), or a mustard color (Obs. 16, 19), or, finally, sometimes an orange or pistachio color.

This discoloration was not the same through the whole extent of the liver, more marked in the left than in the right lobe, it was also more uniform. In cases where the color was uniform in the left lobe, there was in the right lobe a mixture of gum yellow, orange, or red points, larger or smaller, or else we found in the right lobe a rose tint which did not exist in the left lobe.

The cases in which the color of the liver was formed by the mingling of different colored points, were rare, and this disposition was somewhat remarkable in one of them, where the liver presented a mixture of yellow and green points. The last color could not be considered the result of commencing putrefaction, for the subject was opened six hours after death.

In the three cases referred to above, in which the discoloration of the liver was not universal, the right lobe preserved its natural color throughout, or in its obtuse edge only (Obs. 8, 9, 24).

With the discoloration of the liver, we found a more or less marked paleness, and a diminished quantity of blood, so that wherever this appearance of the liver was well marked, the sections of it were dry, and of an arid appearance in the left lobe.



This appearance reminded us at first of the greasy transformation of the liver, a transformation always accompanied by a softening, more or less marked. In the cases now under consideration, the cohesion of the liver was not at all diminished, even where this organ was of a clear coffee and milk color, or of a straw yellow, or of the color of sole leather. The consistence of the liver was increased in several other cases.

This paleness, this anæmic state of the liver, is the more remarkable, as no other viscus was found in the same condition, and many of them, as the lungs and stomach, contained a greater quantity of blood than usual. Nor can we regard this alteration of the liver as the product of inflammation. In almost all the cases, the organ preserved its usual size, its firmness was as great and it contained less blood than in its natural state. These characters are the reverse of those of inflammation, of acute inflammation especially, such as we must suppose here.

In the present state of science, it seems to me impossible to determine the nature of this alteration. Nor is the cause of it less difficult to be ascertained. We cannot exactly attribute it to hemorrhage of the intestinal canal, as this hemorrhage did not take place in all the cases where we found the lesion of the liver, nor, for the same reason, to a derivation



produced by the inflammation of the mucous membrane of the stomach or duodenum. Nor do we find a similar lesion of the liver at the termination of those acute diseases where this mucous membrane has been inflamed. We should recollect also, that the first symptoms of the inflammation of the gastric and duodenal mucous membrane shewed themselves sometime after the attack of the fever, whilst the alteration of the liver was most marked in a case terminated by death three days and some hours after its commencement. From this fact, we must place the commencement of the lesion either at the same time with, or soon after, the commencement of the disease itself.

But the most remarkable fact is, that the liver is the only organ constantly and more or less uniformly altered in the subjects who have died of the yellow fever of Gibraltar, and whom we have opened. Nor is this alteration found in subjects dying of other diseases, so that we must necessarily consider it the anatomical character of the yellow fever. This character is so much the more worthy of our attention, since in the cases where no black matter was found in the stomach and intestines, there was no other means of distinguishing the bodies from those of individuals who have died of other acute diseases. How important is this character to any one who is called upon to study an epidemic at its commence-

ment, or to answer the question, is the yellow fever ever sporadic at Gibraltar?

The following observation will confirm what has previously been said. It relates to a child of the twenty-third regiment, seven years of age, who died of the epidemic fever at the naval hospital, and whose history during life, unfortunately, we have not obtained.

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#### ELEVENTH OBSERVATION.

*Autopsy 7th of Dec., twenty-two hours after death.*

EXTERIOR. — *Embonpoint* very moderate. Universal deep yellow color; no stripes; no ecchymosis; *muscles* pale; cadaverous rigidity slight.

HEAD. — Some traces of *sub-arachnoid* infiltration. *Pacchioni's glands* yellowish and voluminous at the middle part of the interval between the hemispheres. *Pia mater* slightly injected. *Cortical* substance of a lac rose color. *Medullary* slightly injected; both of them soft, but only so in proportion to the age of the subject; a half spoon full of serum in each of the lateral *ventricles*; *cerebellum*, *pons varolii*, *medulla oblongata* natural.

CHEST. — The *pericardium* and the *heart* were not remarkable. The *aorta* contained a moderate

quantity of blood, and preserved its natural color. The *lungs* were perfectly free, of rather a bright red color, except inferiorly and posteriorly, where they had a brown red color, a consistence greater than usual, containing a considerable quantity of blood without air. No effusion in the pleural cavities.

ABDOMEN. — No serum in the peritoneum. Mucous membrane of the *œsophagus* ruddy and yellowish, in other respects natural. The size of the *stomach* was greater than natural, there were a great many folds in its mucous membrane, which retained through its whole extent its natural consistence, thickness and color, except near the cardia, over a surface of an inch and a half, where were several rose spots, as if made by a brush. It was nowhere mamelonated. The *duodenum* was natural. The *small intestine* was of its usual size, and contained a moderate quantity of mucus. Its mucous membrane was pale or ruddy, it gave strips of from five to eight lines, and was no where unusually thick. We found some vascular ramifications in the lining membrane of the great intestine, the consistence and thickness of which were natural. The *liver* was not remarkable for its size ; its cohesion, and consistence were increased, its color was a clear yellow, inclining to a buff color. Its left lobe was paler than the right, which was shaded with a delicate rose color in some parts, and in spots the color was of a lighter rose. The

*gall-bladder* was natural, the bile contained in it was of a deep green color, the *biliary ducts* perfectly natural. The *bladder* was distended, four inches above the pubis, and contained a great quantity of urine. The *kidneys*, the *spleen* and the *pancreas*, were natural.

The surgeon of the regiment believed this boy to have died of yellow fever, and though the symptoms have not been communicated to us and we have found no black matter in the alimentary canal, we must approve of the diagnosis; first, because the two principal alterations which we have observed in the individuals who fell victims to the yellow fever were present; and secondly, because we did not find the lesions of any other acute disease. Remarking that the alteration of the liver was the only important one, for the yellowness must be considered as secondary to the state of the liver, we come to the conclusion to which we have already referred, that this alteration of the liver, is the only essential one, the most characteristic of all those we have described; decidedly more so than the presence of black matter, which was not observed in all the cases.

Here, again, we find no explanation of the death in the state of the viscera, and this is precisely one of those facts which shew most incontestably how much we must attribute to the *cause* of the yellow

fever, not only in the production of the symptoms, but in the fatal termination of the disease.

Having studied the condition of the liver, let us examine how far its lesions are constant and uniform.

I must say then, that this alteration was not found in a subject who was given to us as having died of yellow fever, but this fact, instead of diminishing, increases the value of the conclusions which seemed to be the strict results of observation. Mr. Frazer very kindly gave us the history of the symptoms.

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#### TWELFTH OBSERVATION.

JUAN DOMINIQUEZ, æt. 30, having been exposed to moisture during the night in the civil camp, was seized in the morning with chills and fever. He was brought to the lazaretto, where he remained three days, after which time he was taken to the civil hospital, not having experienced up to that time, according to Mr. Frazer, any symptom which would lead to a suspicion of the epidemic affection.

The fourth day of the disease, and the day after that on which he arrived at the hospital, a foot bath and a drachm of jalap were prescribed.

The next day, the 19th of November, he got up, appeared convalescent, his tongue was clean, and a purgative draught was prescribed. Subject to

epistaxis, he bled at the nose the following night, and the morning of the 20th, he was not so well although without fever. He had an effervescent draught.

The night, and the next day, the patient was comfortable, and the same draught was continued the 21st. The improvement continued the 22d, and the patient took a little *boiullon* from time to time.

The 23d, the pulse seventy, the tongue a little coated : effervescent draught, food.

The 24th and 25th, cough frequent, no expectoration. An ammoniacal mixture with three drachms of camphor, to be taken by the spoonful every two hours, was prescribed,

The 26th, constant sweats, profound indifference, prostration not to be accounted for.

Sulphate of quinine  $\mathfrak{D}$  j, white wine  $\mathfrak{z}$  xii, common water  $\mathfrak{z}$  vj to be mixed together, and taken an ounce and a half at a time, three times a day.

The 27th, the patient directed the attention of the surgeon to a gangrenous spot on the prepuce, which had been there three days. The tongue was partly covered with a brownish coat ; dejections numerous, foetid ; he slept a great deal ; the perspiration uninterrupted ; increased prostration.

Emollient poultice to the penis ; a scruple of camphor towards evening.

The 28th, the gangrenous spot appeared stationary ; the diarrhoea continued.



Infusion of quinine acidulated with eight ounces of sulphuric acid. Port wine for drink.

The 29th, the eschar fell off; the dejections numerous.

Aromatic and anodyne potion to be taken by the spoonful every two hours.

The patient was quiet during the night; the diarrhœa less than during the day; the weakness increasing. The same draught was continued. The first of December, the tongue was more coated than usual; the dejections black; yellowness universal; extension of the gangrene; death during the night.

*Autopsy fifteen hours after death.*

EXTERIOR. — Cadaverous rigidity well marked; skin yellow; *muscular* prominences well marked; no ecchymosis.

HEAD. — *Dura mater* of rather a deep yellow color; *sub-arachnoid* infiltration principally behind; *cortical* substance of brain and cerebellum of a rose color; *medullary* substance injected; a half spoonful of clear colorless serum in the lateral *ventricles*.

The *spine* could not be opened.

CHEST. — *Heart* perfectly natural, no fibrinous clot; *aorta* rather more yellow internally than usual, containing a considerable quantity of black blood.



The *lungs* filled exactly the pleural cavities; the *right* was not remarkable; the *left* adhered in some points of its summit to the costal pleura, and in the same part we found some crude or suppurated tubercles. Its inferior lobe was heavy, hard, impermeable to air, granulated, as in the second degree of pneumonia.

ABDOMEN. — Mucous membrane of the *oesophagus* brownish, in other respects natural. *Stomach* larger than usual, containing about a pound of a bistre liquid, like soot mixed with water. Its mucous membrane was of a greenish yellow, velvety in its upper half, of rather a uniform vermilion red in its lower half, as if this color had been placed there with a brush. At the junction of these two halves there was a very sensible difference of level, a difference which seemed to result from a thin state of the first half of the membrane, and from a thickening of the second half. This was mamelonnated, and its strips were of from four to eight lines; the strips of the other part were of from one to three lines. The mucous membrane of the *duodenum* was of a pale yellow, and its strips were only a line and a half in its valvular portion. The crypts of its first portion were more developed than in its natural state. The *small intestine* contained, through its whole length, a greenish grey mucus of the consistence of fish glue; its mucous membrane retained its

natural color, and gave strips of from two to four lines in the jejunum, of from three to six in the ileum. In several of *Peyer's glands* were ulcerations with a greyish bottom. Ten of them were found with smooth edges, and in one the muscular coat was exposed. The mucous membrane of the *large intestine* was pale and softened, so that we could not obtain strips from it in the first two feet. Farther down these strips were of from two to three lines only. The *mesenteric glands* preserved their usual color and size. The *liver* was of its common dimensions, its cohesion and consistence were natural, its color was a reddish brown. The *gall bladder* was triple its usual size, and contained a clear fluid of a lemon color. Its mucous membrane was yellow, not thickened, and had no longer its usual appearance. The *spleen* was of four times its natural size, and had lost nothing of its natural consistence; patches of a blackish red were found through its whole thickness. The other viscera natural.

A careful examination of the symptoms and the lesions will convince us that this patient died of a disease very different from the yellow fever. The illness continued sixteen days, a duration not observed in the yellow fever. The redness of the eyes, so frequent at the commencement and during the course of that disease, does not appear to have

existed here. Instead of the anxiety so common in the severe cases of yellow fever, there was, at a certain period, a great deal of somnolence and an extreme indifference. If the patient vomited, as the effervescent draughts would seem to indicate, the matter vomited, probably, was not remarkable. It was not black, or it would have been noted. A yellowness was observed, but only in the last days, such as we find at the same period in other acute diseases. The liver was natural; the bile of the gall bladder abundant, and of a dull color; several of Peyer's glands very much diseased; the spleen of four times its usual size; so that, as I have said, Juan Dominiguez did not experience during life the symptoms of the yellow fever, nor were the characteristic lesions of that disease found after death. But, on the contrary, many of his symptoms during life were those of typhoid fever, and, at the post-mortem examination, we observed that alteration of Peyer's glands, which forms the anatomical character of that disease. Consequently, we must acknowledge that he died of this latter disease, so that this fact confirms all that has been previously said of the alteration of the liver. And lest it should be objected that this would not have been found to be true on further observation, I shall give another case of this kind, that of a soldier, whom we observ-

ed during life, and the only one whose entire history we have taken.

One thing, so evident that it hardly need be pointed out, is, that a physician, unacquainted with the characters of typhoid fever, would have inevitably committed here a double mistake. In the first place, he would have considered this case as an example of the extreme irregularity of the course of yellow fever in certain persons; and in the second place, he would have seen here a proof of the impossibility of finding in the liver the anatomical character of the disease.

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#### THIRTEENTH OBSERVATION.

THOMAS PEARSON, a soldier of the artillery corps, æt. 24, of a strong constitution, was brought to the hospital of the royal artillery the 27th of November, 1828. Six months at Gibraltar, he was in camp at the southern gate, where for three weeks he had been employed as cook. He complained of diarrhœa; pains in the throat; during the last three days he had coughed at intervals; and in the morning he had experienced chills followed by a moderate heat, with a sensation of very marked

prostration, without headache or pain in the limbs. Soon after his admission, a powder of calomel, scammony and jalap, of each eight grains, followed in two hours by an ounce of castor oil ; two grains of calomel with the same quantity of James' powder, to be taken every three hours ; were prescribed.

The 28th, at ten o'clock in the morning, after a restless and sleepless night, the eyes were brilliant and moist ; the countenance in other respects natural ; no headache, nor pain in the loins, nor in any other part, except the back of the mouth. The deglutition was impeded, the uvula red and swollen, the tonsils of the same color, not enlarged ; the tongue whitish, and covered posteriorly with a slight coat, its edges red ; the abdomen supple and indolent ; nine dejections since the administration of the purgatives ; the skin dry and hot ; the pulse irregular, small, feeble, easily compressed, one hundred and forty ; the respiration accelerated. The patient appeared inattentive and absent ; sat up in bed without difficulty. No epistaxis.

The calomel and James' powders to be continued with one quarter of a grain of opium ; oil enemata.

During the night Pearson was troubled with nausea and vomiting ; the dejections were liquid ; he passed his water without difficulty ; no sleep. The 29th, the state of his faculties had not changed ; the eyes were neither brilliant nor injected ;

their color natural; the pain of the throat was somewhat increased; the deglutition difficult; the left side of the epigastric region painful; nausea at intervals; the pulse regular and soft, one hundred and twenty; the rest as on the preceding day. Besides the pills and the drinks, a pound of weak infusion of coffee, and a blister to the epigastric region, were prescribed.

The patient was quiet in the night; had some sleep, and six dejections soon after the administration of an ounce of castor oil and two drachms of the tincture of senna.

The 30th, Pearson felt a little better, complaining much of weakness. His countenance was natural; the angles of the eyes injected; the answers ready, the posture natural; the pulse small and feeble, one hundred and sixteen; the heat increased; the tongue in the same state as on the preceding day; the epigastrium indolent; neither headache nor pain in the limbs. A pill of three grains of calomel and two grains of James' powder, with a quarter of a grain of the gummy extract of opium, every three hours, was prescribed.

The patient complained of no suffering; was slightly delirious, and had several dejections of a good color during the night.

The 1st of December, the answers were slow, sometimes at random; the countenance sad; the



pulse feeble, one hundred; the central part of the tongue brownish; the anterior part dry and red; the edges deficient in moisture. In the evening a blister had been applied, of which he did not complain.

From this time until the seventeenth day, that of the death, the patient was constantly delirious during the night, and during the day. When awake he preserved an uninterrupted silence, or sometimes gave absurd answers. In the night of the fourth and fifth, he attempted to leave his bed; and the following night he made more violent efforts, so that he was kept in bed with some difficulty. The weakness increased, and the twenty-sixth, Pearson could not sit up, his hands trembled. The pulse was feeble, now more now less unequal, at one hundred and twenty, one hundred and fifty, one hundred and thirty, the second, third, fourth and fifth; the sixth it was at ninety-six, regular, easily compressed, the heat slight; the throat was somewhat painful, the deglutition as on the fourth, and up to that day the edges of the tongue were of a bright red color; the fourth and fifth, it was almost natural; the sixth, it was red and dry. During the evening of the second, there was a vomiting of mucus, none afterwards. The stools were more or less numerous, the fæcal matter pultaceous, of the color of coffee and milk the third. The conforma-



tion of the abdomen was natural; there was no epistaxis at any period.

The morning of the second, pills were prescribed, composed of one or two grains of calomel, of a grain of James' powder, and of a quarter of a grain of opium, to be taken every four hours; and later, a mixture of six ounces of water, two ounces of the spirit of mindererus with an ounce of the sweet spirits of nitre and two drachms of antimonial liquor. Bouillon and six ounces of sherry wine mixed with two thirds of that quantity of water.

The evening of the third, to that prescription two enemata were added. The fourth, the pills were discontinued on account of soreness of the gums, but the potion was continued, and the patient took with pleasure half a bottle of porter. It was the same on the fifth, and that day he was allowed to take a little sago, in addition to his other nourishment.

Pearson died on the night of the sixth and seventh, towards midnight.

*Autopsy thirteen hours after death.*

EXTERIOR. — Body well formed; considerable rigidity; color natural, no lateral stripes; numerous sudamina on the middle part of the abdomen and neck, less numerous and smaller on the chest.

HEAD. — Considerable *sub-arachnoid* infiltration at the middle and superior part of the brain, especially near the longitudinal furrow; *pia-mater* slightly injected in some points; *cortical* substance natural; the *medullary* slightly dotted with blood, soft with a slight shade of lilac in some points in the upper part of the brain. A spoonful of clear serum in each lateral ventricle; the *cerebellum*, the *pons varolii*, and the *medulla oblongata*, not remarkable.

NECK. — *Pharynx* red, its mucous membrane of a proper thickness and consistence; no ulceration; *tonsils* of a moderate size; *Epiglottis* large and red superiorly, its edge of double its usual thickness. Its mucous membrane was destroyed laterally and superiorly, on the right and left, in the extent of about a line and a half, and its fibro cartilage laid bare in the corresponding point; *trachea* red in upper part, in other respects natural.

CHEST. — Left *lung* free, and natural as well as corresponding *pleura*. The right pleural cavity contained from a pound and a half to two pounds of a thin, greyish, and troubled liquid. The lung of the same side was of a uniform and deep red, its base congested. Nearly its whole surface was covered by a yellowish and unequal false membrane.— The *heart* contained a small quantity of liquid blood, no clots. The *aorta* was bathed by the same liquid

in the same condition, and preserved its natural yellow color.

ABDOMEN. — The *œsophagus* deprived of epidermis in its whole length ; its mucous membrane in other respects natural. The *stomach* of a moderate size, contained from eight to ten ounces of a thin greenish liquid, of a bitter taste. Its mucous membrane was dotted with a clear vermilion red in a part of the great cul-de-sac, elsewhere of a yellowish white color. Its appearance through its whole extent was mamelonated, velvety, and its strips were from six to seven lines in length in the middle part of the great curvature, from four to five in a great portion of the anterior face, from eight to eleven along the small curvature and in the pyloric region. The *duodenum* was of its usual diameter ; its mucous membrane, of a clear rose tint in some points, was of a good consistence. Its crypts were but slightly developed. The *small intestine* was of a moderate size and contained a considerable quantity of greenish mucus, the color of which became deeper as it was examined nearer the cœcum. The mucous membrane injected here and there, whitish in the *jejunum*, where it gave strips of from two to five lines ; in the five last feet of the *ileum* it was more or less injected and had a lilac color. In the first half of this part of the intestine its strips were from four to five lines, lower down from four lines to one, and in

the two last feet its consistence was that of mucus. Fourteen large ulcerations were found opposite the *mesentery* in the six last feet. The first six, the farthest from the cœcum, were half an inch, more or less, in diameter, reddish, a color owing to the thickness of the sub-mucous cellular tissue laid bare by the destruction of the corresponding mucous membrane. The others were oval, nearly round, of a greyish and yellowish color, owing to the sub-mucous cellular tissue thickened and laid bare, as I have just said; and from this tissue we obtained strips of the same color, of an extreme fetidity, as if affected by gangrene. The edges of these ulcerations were reddish, prominent in consequence of the thickened state of the mucus and sub-mucous coats. The muscular coat at the bottom of these ulcerations was red, and a third of a line in thickness. Just before the cœcum, the intestine was ulcerated all round, of the width of an inch, and the ulceration was similar to those we have described. Two others, from two to three lines in diameter, were found between the two last, not opposite to the mesentery. The cœcum and the greater part of the colon contained a considerable quantity of reddish liquid, thicker, more abundant, of a deeper color, in the cœcum than any where else. Beyond this first part, the mucous membrane of the *large intestine* was much less colored,

scarcely thickened, and in this first part of the great intestine were two small ulcerations similar to those which have been described in the ileum. In the last half the strips were from five to six lines. The *mesenteric glands* corresponding to the ulcerated glands were red, unequally softened, but contained no pus. Several of them were three quarters of an inch in diameter. The size of the *liver* was slightly increased, it was soft, less coherent than natural. The red grains of its right lobe were very distinct and placed on a pale rose ground. This double color was less distinct in the left lobe, the consistence of which was greater. The *gall bladder* contained a moderate quantity of bile, viscous, of a deep green color. The *biliary ducts* were not remarkable. The *spleen* was of a wine lees color, very much softened, and of twice its usual size. The other viscera natural.

If the examination of the symptoms and the lesions of the subject of the twelfth observation shews, that he died not of yellow, but of typhoid fever, the same examination in the subject of the last observation leads still more necessarily to the same result, Pearson's symptoms and lesions having been described in greater detail. Not only was the essential anatomical character of typhoid fever, the alteration of

Peyer's glands, found in this case, and to a marked degree, but two of the secondary anatomical characters also. I refer to the sudamina and to the ulceration of the lateral parts of the epiglottis. The liver, far from resembling those of the victims of yellow fever, presented no other appreciable alteration than a slight apparent increase in size, and a little softening. We should remark also that a frequent lesion of the lungs of individuals, dying of yellow fever, was not found either in Pearson or in the subject of the twelfth observation.

Thus, this fact and the preceding one shew, as I have already said, that I was not wrong in the importance which I have attached to the alteration of the liver, since, in a climate different from that of Paris, this alteration did not take place in a disease, which more than one physician, though without doubt erroneously, has believed to be more or less identical with the yellow fever.

Two other consequences flow naturally from the twelfth and thirteenth observations, namely, that considerable differences in climate are not sufficient to alter, at least sensibly, the anatomical characters of diseases; and, secondly, that all diseases are not alike when a fatal epidemic is raging.



## ARTICLE II.

## BILE AND GALL BLADDER.

It is fair to presume on account of the anæmic state of the liver in individuals dying of the yellow fever of Gibraltar, that the secretion of bile was not abundant in the course of that disease. Very little of it was found in the stomach and small intestines of the subjects whom we have opened ; and in the same cases, the gall bladder contained less bile than is found in the victims of other acute diseases, and especially less than in those who have died of typhoid fever, where the bile is abundant, of a pale color, and of little consistence, characters the opposite of those found in the cases we are now studying, in all of which the bile was thick, scanty, and of a dark green color. Two cases form exceptions, where the mucous membrane of the gall bladder was no longer natural. The abundance of the bile in these cases must be regarded as accidental, and rather apparent than real, it having been mixed with the product of an uncommon secretion. In one of these cases the gall bladder contained a deep red, bitter fluid with two clots of blood ; its mucous membrane was of a dark red color, slightly softened (7). In the other case this membrane was dotted with red, the liquid with which it was in con-

tact was of the color of urine, and the gall bladder was five inches in length.

The *biliary ducts* were free, and the mucous membrane lining them perfectly natural, in all the cases. A large red and softened lymphatic gland, pressed on one of the ducts in one of the subjects of whom we have just spoken, and had, perhaps, somewhat contributed by its pressure to the alteration of the gall bladder.

Except the clots of blood found in the gall bladder in one case, this receptacle and the biliary ducts, were not remarkable in those dying of the yellow fever of Gibraltar, and the natural state of the *biliary* canals shews, that in this disease, and contrary to what exists in the acute diseases of Paris, the yellowness takes place without any impediment to the free course of the bile in the biliary ducts.

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## CHAPTER VIII.

### SPLEEN.

THE spleen preserved its natural size, cohesion and firmness in half the cases. It was increased in

five, but generally in a slight degree, and indeed, with but one exception, where it was of four times its usual size, without any alteration of its consistence. This case was that of an individual who had lived at Mahon, where intermittent fevers are endemic. The spleen was softened in eight cases, and in only one of them to a remarkable degree.

As to size and cohesion, the spleen was in a very different state from that it presents in individuals who have died of typhoid fever. Comparing these lesions with those which are found in individuals dying of the acute diseases of Paris, the only difference detected is that they are more frequent in the latter.

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## CHAPTER IX.

### URINARY ORGANS.

THE kidneys were natural in more than half the cases, that is, in fourteen of the twenty-three whose histories we are analysing, and in none of these were they larger than natural. Their consistence was diminished in three cases, that is to say, they were

broken down much more easily than usual. They were yellowish through their whole thickness, or in that of their cortical substance only, in six subjects (Obs. 1, 3, 10, 20, 22, 24). This substance was dotted with red in one case (18), streaked with red in another case. Finally the whole thickness of the kidneys was of a livid red in one case (2).

The bladder generally was collapsed, and not remarkable. Its mucous membrane was natural in all the cases, even in one where we found some ecchymosis in the subjacent cellular tissue.

The ureters were natural. Thus, in patients carried off by the yellow fever of Gibraltar, as in those dying of other acute diseases, the urinary organs were almost always natural.

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## CHAPTER X.

### CAUSES OF DEATH.

HAVING already remarked several times at the close of the preceding observations, that it was by no means always possible to explain the death of those, who fell victims to the yellow fever of Gibraltar, by means of the condition of their organs, I have now to point out the proportion in which this is the

case. There are, however, real difficulties in an attempt of this sort, and in some cases there is even uncertainty. Lesions, apparently slight, may explain the death when they have taken place rapidly, as in the cases now under consideration. And then again, in the present state of science we cannot appreciate the nature of the specific lesion of the liver, and consequently we cannot determine how far it had any thing to do with the death. I shall have regard to these two circumstances in my investigation of the causes of the death of the individuals, whose histories I am analysing, and for that reason I count on the reader's approbation of my conclusions.

In eight of the twenty cases, where all of the organs were examined, the death of the patients remained unexplained by the condition of the organs. It has seemed to me difficult, not to say impossible, considering the remarks which I have just made, to explain the death in this way in five cases (Obs. 2, 3, 7, 8, 19). In seven others, this mode of explanation was sufficiently satisfactory. In the eight subjects whose death could not be explained by the condition of the organs, the mucous membrane of the stomach was natural or slightly altered, that of the intestine was nearly in the same condition. The lungs were natural in two of them, congested at their base in a third, more or

less engorged with blood (probably an effect of the agony) in three others. They presented but very slight lesions in the two last. The spleen was natural, or nearly so, in all the cases. The cohesion of the liver somewhat diminished in four cases, natural or increased in the others. The brain and its membrane presented very slight lesions. The quantity of black matter found in the stomach or intestine was small. In no case could much importance be attributed to it in the point of view under which it is here considered. How can we explain the death of these individuals by the condition of their organs?

This fact is valuable, on account of the consequences which flow from it. We do not observe the same in any thing like such a proportion in the course of other acute diseases. For this reason it is one of the characteristics of the yellow fever, at least of that fever which prevailed epidemically in Gibraltar in 1828. And if observation shews that there is in disease something beyond what we see, that its cause has sometimes a great deal to do with the death of those who are attacked by it, this double proposition is more evident here, where we must admit that the cause of the disease often kills by itself, or independently of appreciable alterations of the organs, and even up to a certain point, of apparent derangement of the functions. We



must remember that nearly the same thing happens in many cases of poisoning.

It results also from the facts we are studying, that if an intimate knowledge of the lesions observed in subjects dying of yellow fever is indispensable to the practitioner, he must also remember that in this disease, as in others, there is something besides these lesions, and that he must profit by all that experience or chance may teach him of the best mode of treatment. The treatment called rational is less sufficient here, inasmuch as the most constant of the lesions, that which forms the anatomical character of the disease, cannot be characterised or appreciated in the present state of science, so that we cannot calculate on treating the disease successfully by any of the established modes or formulas.

One of the facts already given by us is very remarkable in this point of view ; for in that individual, the liver was the only evidently diseased organ, so that there, the cause of the disease had a great deal to do with the death. The following observation, though less remarkable, deserves attention, and here appears to be its proper place.

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#### FOURTEENTH OBSERVATION.

BENJAMIN SCOTT, a soldier of the forty-third regiment, æt. 25, of a strong constitution, two years

at Gibraltar, became ill the 3d of December, at seven o'clock in the evening, and was carried the same day to the northern hospital. He had been in Portugal, and had suffered there from diseases of the chest and intermittent fevers. He said that during the last eight days he had mounted guard at the land gate, and very recently on the neutral plains. His illness commenced with chills, which were renewed during the night, unaccompanied by local symptoms, and the next morning at eight o'clock, when observed by Mr. Gilchrist, he complained of pains in his legs and knees, of nausea. The pulse was slightly accelerated, very small, the heat moderate; the tongue whitish, not red; the epigastrium indolent and insensible on pressure. There was no headache, and up to that time, the stools had been regular. A purgative enema, and half an ounce of castor oil an hour later, were prescribed.

The same day, at two o'clock in the afternoon, the patient was in the following condition. The posture frequently changed; the answers correct and rapid; the hearing acute; the eyes of a delicate rose color, not injected; pains in the limbs, sensation of debility; the pulse small, eighty-four; the skin generally injected; the heat moderate, with moisture. The epigastrium indolent; no nausea after the oil; no headache.

The patient vomited his castor oil soon after we

left him, and immediately after the vomiting fifteen leeches were applied to the epigastrium. At eight o'clock in the evening, he took another half ounce of castor oil mixed with a little mucilage, and he retained it. During the night, as he was going to stool, he vomited a drink which he had just taken, but no bile. The 5th, towards ten o'clock A. M., his eyes were brilliant, but neither red nor injected; his hearing acute, no ringing in the ears; the countenance a little redder than natural with a slight expression of stupor; the posture natural. His pulse one hundred, sufficiently large, rather less feeble in the right arm than in the left; the heat increased; the respiration easy; the tongue deficient in moisture, whitish, villous. The patient felt better than he did the day before; neither headache, nor pain in the epigastrium. He complained only of disagreeable sensations in the limbs; he wished to eat, and watched narrowly the countenance of his physician, Mr. Gilchrist. The vomitings continued, the 6th, until the application of a camphor blister to the epigastrium. The morning of the 7th, the vomitings had not recurred in the interval of eighteen hours, which had elapsed since the application of the blister, and they had always been excited by drinks, which were thrown up without any bile. His countenance was, as it were, dusty, and not so red as on the fifth; the eyes not red; the pulse

eighty-eight, very feeble, easily compressed, more so than on the preceding day ; the heat natural ; the skin colored. The tongue, clean anteriorly, villous behind. Two yellowish stools during the night ; the sleep quiet, free from dreams. No headache ; no pain in the limbs. The patient was quiet during the night, and the 8th, he answered well, his countenance was natural, his eyes of a slight greenish tint ; the pulse, seventy, larger than the day before, the heat almost natural, the integuments of the chest of a dull aspect ; the thirst diminished, the deglutition easy ; the epigastrium indolent on pressure with the hand. There had been nausea and vomiting. The patient thought he had a little appetite. He passed his water without difficulty, and two small dejections which were moulded. His motions were easy ; no anxiety.

He died the next day, at one o'clock, A. M.

*Autopsy eleven and a half hours after death.*

EXTERIOR. — The conformation perfect ; cadaverous rigidity well marked ; no ecchymosis ; no yellowness.

HEAD. — The *membranes* of the brain natural ; the *cortical* substance of a grey dove color ; *medullary* substance slightly injected ; both substances of

a proper consistence. One small spoonful of serum in the lateral *ventricles*; *cerebellum*, *pons varolii*, natural.

The *trachea* was not opened.

CHEST. — Two spoons full of serum in the *pericardium*. *Heart* larger than natural, flabby, preserving its cohesion, containing a little black and liquid blood. Its internal membrane of a delicate rose color. The *aorta* contained a small clot, with a great deal of black and liquid blood, and its walls, like those of the large arterial trunks, were of a more or less bright rose color. The *lungs* were natural. No ecchymosis. The *right* lung adhered to the costal pleura by slightly infiltrated cellular attachments. The mucous membrane of the *bronchi* was red, in other respects, natural. Near the trachea, were two tumors of the size of a nut, formed by a matter resembling putty, and contained in a cyst one line in thickness, the internal face of which had the appearance of a mucous membrane.

ABDOMEN. — The *stomach* was of its natural size, and contained a pound and a half of a dark yellowish liquid, mixed with a little mucus. Its lining membrane was of a yellowish grey color anteriorly, of a wine red color posteriorly, except in the neighborhood of the pylorus. Its anterior face mamelonated, its posterior face was so also, near the pylorus, to the width of from three to four inches. We found

here also several depressions, some of which had a puckered appearance, resembling some cutaneous eruptions. The thickness of the mucous membrane was slightly increased, except in the great cul-de-sac, where it appeared softened, less adherent than usual to the sub-mucous cellular tissue. The mucous membrane of the *small intestine* was covered by a moderate quantity of greyish mucus ; it gave strips of from four to five lines in its whole length, and preserved its natural color, except near the ileo-cæcal valve, where it was moderately injected. A similar injection penetrated the sub-mucous cellular tissue in a great extent. *Peyer's glands* were natural. The *large intestine* contained through its whole length a chocolate colored matter. Its mucus membrane was of a slate color in the arch of the colon, where we found white lenticular spots. In other respects, it preserved its usual appearance, its proper thickness and consistence. Its strips were from ten to fifteen lines. The *liver* was of its natural size, of a straw yellow color, to the left of its suspensory ligament, of a greenish yellow to the right of it. Its consistence was normal, its cohesion greater than usual. In the interior of the left lobe, the yellow color was spotted with points of a deeper color. Red spots interrupted the uniformity of the yellow color of the right lobe. The *gall bladder* was of its usual size, and contained



a viscous and very dark green bile. The *biliary ducts* were not remarkable. The other viscera were natural.

This fact has more than one claim on our attention. Beginning with the subject especially under consideration, I observe, that though the mucous membrane of the stomach was mamelonated in a great part of its extent, a little thickened and softened, these lesions were partial and inconsiderable. One of them, the mamelonated state of the mucous membrane of the stomach, may have been an old affair. The want of redness in the corresponding points renders this explanation probable. The mucous membrane of the small intestine and colon was of a natural consistence and thickness; the other viscera, except the liver, were not remarkable, so that it is impossible to explain satisfactorily the death of the subject by the condition of his organs, even taking into account the progress of the disease, which was less rapid here than in other cases. Amongst other circumstances worthy of notice, we would point out particularly the slight degree of severity, we may even say the mildness of the symptoms, which, at all periods of the disease, authorised the hope of recovery. There was neither anxiety nor pain at the epigastrium, not even on pressure. The vomitings were not spontaneous, they were always excited by medicines or drinks, were neither black nor yellow

at any period. The same was true of the stools. Except a slight stupor on the third day, the countenance preserved its natural expression, the pains in the limbs were slight, and the last time we saw the patient, his disease appeared about to end in convalescence rather than death.

We should again remark, that not only the patient vomited no black matter, but that there was none in the stomach, so that what was found in the course of the large intestine, was probably the exhalation of its mucous membrane. And, lastly, let us again speak of the importance to be attached to the lesion of the liver, as the only one characteristic of the yellow fever. We certainly cannot doubt as to the character of the disease of which Scott has died. His symptoms and his lesions were not those of any other disease. It is true that spontaneous vomitings and yellowness were wanting, there was no black matter in the stomach or in the small intestine, the chocolate colored matter found in the colon cannot be considered as pathognomonic, because the same is occasionally found in subjects dying of other acute diseases. So that the well marked lesion of the liver was the only one shewing the body of Scott to be that of an individual dead of yellow fever.

In those cases, where we cannot say that death was unexplained by the condition of the viscera, and

where the condition of the viscera accounted satisfactorily for the death, the principal lesions to which we can attribute the fatal termination of the disease, were those of the mucous membrane of the intestines, that of the colon especially, or those of the mucous membrane of the stomach and small intestines together (Obs. 2, 16, 20, 21) ; or that of the stomach principally. As to the exhalation of blood in the intestinal canal, I found but a single case where it was so abundant as to be regarded as one of the principal causes of death. This case is that of a young girl, Maria Bisell, eight years of age, the history of whose symptoms was communicated to us by Mr. Frazer.

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#### FIFTEENTH OBSERVATION.

This young girl, whose illness was but of five days duration, entered the civil hospital the 20th of December. On the 21st, says Mr. Frazer, she presented the symptoms of a violent attack of the epidemic, and, as on the preceding day, an ounce of castor oil was taken by her. The symptoms became more severe, and the 22d, the black vomit came on ; the skin was universally yellow ; the eyes were of the

same color and moist; the tongue of a bright red with a whitish coat; the pulse feeble.

Six pills containing twelve grains of camphor and a grain of opium were ordered to be taken, one every hour. Effervescent drinks.

The black vomit was abundant, came on repeatedly in the course of the day and night, the little patient dozed whenever left alone, and on being awakened her ideas were confused.

The 23d, her condition was the same, except that her tongue was clean. The vomit was less considerable the next day, and the patient died in the afternoon, having been in a state of drowsiness during the last hours of her life.

*Autopsy 25th of December, seventeen hours after death.*

EXTERIOR. — The conformation perfect; the *embonpoint* moderate; the lips colored brown; universal yellowness; marked cadaverous rigidity; no stripes anteriorly or laterally.

HEAD. — The *membranes* natural; no *sub-arachnoid* infiltration; a small quantity of serum in the lateral *ventricles* of the brain; the *cortical* and *medullary* substances natural; the *cerebellum*, the *pons varolii*, the *medulla oblongata* and the *spinal marrow*, natural.

NECK. — Nothing remarkable.

CHEST. — The *lungs* free ; the right containing little air and some blood ; its inferior lobe of a violet red color in its upper part ; firm, more friable than usual, but *not* presenting a granulated aspect. In the posterior part of the left lung, we found spots of a livid red color, but no increase of the density of the tissue in this point ; no serum in the pleural cavities ; the *heart* natural, containing a few drops of liquid blood ; the *aorta* preserved its yellow color, notwithstanding the quantity of blood with which it was in contact.

ABDOMEN. — The *æso-phagus* of a brownish and reddish color ; its *mucous membrane* deprived of epidermis, of a natural thickness and consistence ; the *stomach* small, containing about ten ounces of a violet colored blood, liquid or in clots ; its mucous membrane was in folds of a bistre color, scarcely diversified in some points by a very slight livid rose shade ; its consistence and thickness natural through its whole extent. The mucous membrane of the *duodenum* was of a livid rose color, and softened here and there ; the crypts beneath it were but slightly developed. In the first half of the *small intestine*, we found a considerable quantity of liquid blood, of a deeper red color than that of the stomach. In its second half, there was a little colorless mucus ; its mucous membrane was of a yellowish white color, excepting the valvular folds of the jejunum, which

had a slight rose tint, or were of the color of onion parings ; its thickness was natural ; its consistence less than usual. Its strips were from two to five lines in length in the jejunum, from five to eight in the lower part of the intestine. *Brunner's glands* were not to be distinguished ; *Peyer's patches* were natural. In the first half of the *large intestine*, we found a good deal of blood of the same consistence and color with that found in the jejunum. In this same part, the mucous membrane was livid, and it gave strips of from one to five lines ; elsewhere its consistence and thickness were natural ; the *liver* was of its ordinary size, much firmer than usual, of a very pale yellow, almost of a coffee and milk color, through its whole extent. This color appeared to result from small greenish yellow granulations, on a very clear coffee and milk ground ; the blood contained in the vessels was colorless and liquid ; the *biliary ducts* perfectly natural ; the bile of the *gall-bladder* abundant, moderately thick, of a deep orange color. The *bladder* contained a considerable quantity of urine, but was in other respects perfectly natural ; the other viscera were not remarkable.

The quantity of blood found in the stomach and intestines may be estimated at two pounds. It was not sensibly altered, and undoubtedly was exhaled a short time before death. If we add to this blood



that which had been vomited, we see that the loss of this fluid was really considerable, and ought to be regarded as one of the principal causes of the death of so young a child. We should remark, also, that the mucous membrane of the stomach was natural, excepting in a slight alteration of color, and here again, we see that which I have already had occasion to point out, that the yellow fever of Gibraltar of 1828 is not a gastritis; that the mechanism of the hemorrhage is unknown; that frequent vomitings in the course of the yellow fever by no means indicate with certainty the existence of any appreciable lesion of the gastric mucous membrane.

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## RECAPITULATION.

THE facts which I have analyzed in this second part of my work, may be summed up as follows.

1st. In the cases where we found an effusion of serum in the arachnoid cavity, or in the lateral ventricles of the brain, or in the sub-arachnoid tissue — the quantity of it was inconsiderable.

2d. The pia mater was injected in six cases.

3d. The cortical substance of the brain was rose or violet in nine cases.

4th. The medullary substance of the same organ was decidedly injected in five cases, of a less consistence than usual in one subject : of a slight unequal non-continuous lilac tint in another.

5th. The cortical substance of the cerebellum was rose or violet in six cases.

6th. In all, the spinal arachnoid contained from two to four ounces of clear serum.

7th. The spinal marrow was flaccid through its whole extent in two cases, examined six and twenty two hours after death. Its cohesion was greater than natural in another case.

8th. The epiglottis was red, its mucous membrane more or less thickened, and partially so, in two cases.

9th. That of the larynx was of a bright red in two cases.

10th. The mucous membrane of the trachea was red and a little softened in one case.

11th. We found black spots, and generally many of them, through the whole thickness of the lungs, in nine subjects. They were of different dimensions, and the tissue surrounding them increased in density in most of the cases. This was sometimes entirely deprived of air in consequence of the effusion of a greater or less quantity of blood more or less com-

bined with air. In six cases we found in the lungs tumors of a blackish red color, of an irregular form, containing no air, not granulated, more or less firm, without evident organization.

12th. In one case we found in each pleura an effusion of six ounces. They contained one or two spoons full of the same liquid, more or less colorless in five other cases.

13th. In five cases we found one or two spoons full of lemon colored serum in the pericardium, in one case the serum was red.

14th. The heart was flaccid, softened or less coherent than usual, in seven cases, and in four of them its lining membrane was red.

15th. The aorta was rose colored or red internally in the whole or in a part of its extent in six cases.

16th. The color of the pharynx was slightly altered in three fifths of the cases.

17th. In the same cases there was a similar alteration of the tonsils, the size of which was increased in two cases.

18th. The œsophagus was completely deprived of epidermis through its whole length in a third part of the cases, and partially so in a greater number.

19th. The stomach was larger than natural in seven subjects, smaller than usual in three. It contained a clear or dark red colored liquid, a black-

ish or a perfectly black fluid, in different quantities, in three quarters of the cases. Its mucous membrane was red through a greater or less extent in six cases ; rose colored or orange in eight cases ; greyish, yellowish, or whitish, in the others. It was thickened through a greater or less extent of surface in half the cases ; softened and yellow to an extreme degree in the same number ; at the same time thickened, softened, and red, in a third part of the cases ; mamelonated in two thirds ; ulcerated in two cases. It was natural in five cases.

20th. The mucous membrane of the duodenum was red in a little more than half the cases, softened in the same number, and thickened in one case.

21st. The small intestine contained a greater or less quantity of reddish, brownish, blackish, or perfectly black matter, in two thirds of the cases. Its mucous membrane was slightly injected or red in spaces, in a little less than half the cases. Its consistence was more or less diminished through its whole length, or through a part of its extent only, in rather a greater number of cases. It was partially thickened in one case, in no case was it ulcerated, and Peyer's glands were always natural.

22d. The large intestine was of a greater size than usual in two cases. In fifteen cases, it contained a matter of a wine lees color, or blackish, or brownish, or chocolate colored, or entirely black.

Its mucous membrane was of a pale or bright red color in five cases, greyish, yellowish, or whitish, in the others. Its consistence was more or less diminished in three quarters of the subjects. Its thickness was increased in three cases, and twice we found it slightly ulcerated.

23d. The mesenteric glands presented traces of inflammation in four cases, the cervical glands in one case; in another case one of the glands about the *biliary ducts* was red, softened, and very large.

24th. The liver was of a greater size than natural in two cases; a little firmer than usual in three cases, a little less firm in three others. Its cohesion was increased in six cases, diminished in seven. Its color was altered in every case; sometimes it was of the color of fresh butter, sometimes of a straw yellow, a clear coffee and milk color, sometimes of a gum yellow, sometimes of an orange color.

25th. The spleen was softened in eight cases, and to a moderate degree, with one exception. It was larger than usual in five cases.

The lesions which we have thus placed before the reader, were rarely considerable, very often insufficient to explain the death, and when this explanation was afforded, it was by a combination of several lesions.

These lesions may be divided into two classes, some of them peculiar, or almost exclusively peculiar,

to subjects dying of yellow fever, others common to those subjects, and to subjects who have died of other acute diseases. The red or black matter found in the alimentary canal, and the remarkable alteration of the liver, are of the first class, all the other lesions of the second.

The red or black matter of the stomach and intestine not having been found in all the cases of yellow fever, it cannot be considered an anatomical character of that disease. But it is not so with the alteration of the liver, which was more or less exactly the same in all the cases, and which, for that reason, ought to be considered as the essential anatomical character of the yellow fever of Gibraltar, of 1828.

Amongst the lesions of the second class, the yellowness and the inflammation of the mucous membrane of the stomach should be especially remarked, as well from their frequency, as on account of the rapidity with which they came on. The inflammation of the mucous membrane of the stomach not having taken place in all the cases, and Peyer's glands not having ceased to be natural, it follows, on the one hand, that the yellow fever of Gibraltar, of 1828, is not a gastritis, and on the other hand, that it is not a typhoid fever. This last conclusion is even more strict, for not only was there an absence of the lesions of typhoid fever in the bodies of the victims of yellow fever, but these bodies pre-



sented other lesions which are not found in the victims of the first disease, and which are peculiar to the second disorder.

What then is the nature of the yellow fever of Gibraltar, of 1828, and where is the seat of it? If it be neither a gastritis nor a typhoid fever, neither is it a hemorrhage, as it has lately been said to be, for the hemorrhage did not take place in all the cases. Is it a disease of the liver? Undoubtedly the liver was the organ principally and essentially affected; still we cannot regard the yellow fever as simply a disease of the liver, because its lesion, at least in the present condition of science, does not explain the febrile symptoms in the cases where this was the only lesion, and in the second place, because it is entirely insufficient to explain the death.

As then a strict analysis of the anatomical appearances of the yellow fever of Gibraltar, of 1828, proves the existence of a cause, unequal in its operation, and of which but one effect is constant, the specific alteration of the liver, and as in a third part of the cases, it is directly to this cause that we are obliged to refer the death, we naturally ask how does this cause act, through the medium of what system does it exert its influence on the economy? Is it through the nervous system, is it through the blood, in which, however, we have not detected any especial modifications?

THIRD PART.

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DESCRIPTION OF SYMPTOMS.

This part will comprise the description of the symptoms properly so called, after which, and in as many chapters, I shall examine what has been the mortality of the disease, the influence of age and sex on the mortality ; whether the yellow fever of Gibraltar of 1828, was the same at the commencement and termination of the epidemic ; what are diagnostic symptoms ; and whether a first attack of yellow fever preserves from a second.

## PART III.

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### CHAPTER I.

#### SYMPTOMS.

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#### ARTICLE I.

##### GENERAL DESCRIPTION.

##### SEC. I.—FATAL CASES.

THE disease spared neither sex nor age, men and women, young and old, were alike its subjects. Those only were exempt from its influence, who had gone through with the disease in a former epidemic.

It commenced at different hours of the day, sometimes in the night, sometimes fasting, or soon after eating, usually, with an intense headache, accompanied by chills, shivering, pain in the limbs, and soon after, pain in the back. A heat, rarely intense, succeeded to the chills, and was sometimes followed by perspiration. At the same time the countenance became red and animated ; and in some cases, as it

were, swollen. The eyes were red, glistening, suffused, and in many cases the patients complained of a sensation of smarting in them. The thirst was intense, the anorexy complete. It was rare that the patient suffered any pain in the epigastrium at this period.

The first symptoms, the headache, the pain in the limbs, the anorexy, the thirst, the heat, the redness and the pain in the eyes, continued, the headache during half the disease, the pains in the limbs a little longer, and the heat, which in many cases was but slightly increased, continued so during nearly the same time.

The pain at the epigastrium, so rare at the commencement, came on usually fifteen or twenty hours later. It was generally inconsiderable, and very few patients complained of severe or acute pain. With the epigastric pain came the nausea and vomitings, excited by drinks and purgatives in several cases, spontaneous in others. The dejections were infrequent, that is, where no laxatives had been administered. The abdomen preserved its form, was supple and indolent, except in the epigastric region. The sleep was inconsiderable, some patients were restless, in some there was a good deal of jactitation during the night. Others, and the smaller number, experienced as early as the third day, a real anxiety, could not remain quiet in any posture, and in some

cases there was delirium. But this symptom did not usually come on till the last day of life, and for this reason it is to be considered rather as belonging to the agony than to the disease. Otherwise, with few exceptions, there was neither prostration nor stupor. The pulse was moderately accelerated, regular, generally bearing relation to the degree of heat, which was almost always slight, as I have before said. The skin of the thorax was injected in some cases. This redness, and that of the eyes, diminished towards the middle period of the disease, or a little later, and new symptoms appeared. To the injection of the integuments of the chest there succeeded a slight yellow tint of that part, and the eyes were of the same color. When this color appeared thirty-six or forty-eight hours before death, it became rapidly brighter, so as to be of some intensity at the time of the fatal termination. In other cases where it came on only just before death, it was slight at the autopsy, and commonly limited to the trunk. At about the same period, or a little later, the matter vomited, and the discharges from the bowels, which up to that time had presented nothing remarkable, took on a certain character which they have not in the course of the acute diseases of Paris. The dejections were blackish or black, and the matter vomited, from being of a yellow color, became brown or black. At the commencement of



this change of color, the vomit was of a liquid matter more or less greyish, mixed with a greater or less quantity of mucus, in which were to be seen blackish parcels, like soot. At this period of the disease, the uncomfortable feelings and the anxiety continued during different lengths of time and in different degrees, the strength diminished, the temperature fell, so that the limbs were cold before the agony ; in a certain number of cases there was a suppression of the urine. Sometimes also we observed a sort of remission, an apparent amelioration of the symptoms, and death took place when it would least have been expected, had not experience taught us to distrust his deceitful remission. In some subjects the violence of the headache, that of the pains of the limbs, the marked febrile symptoms, the numerous vomitings, the uncomfortable feelings, the anxiety, the bright redness of the eyes, gave to the disease a truly serious aspect, whilst in others the mildness of the fever and of the pains wherever seated, the absence of agitation and delirium, the slight diminution of the strength, impressed on the disease a character of mildness, calculated to deceive at once, the patients, their attendants, and the physician. It is under this form of the disease that patients died without taking to their beds, on foot, as it was expressed by their friends. Thus Dr. Mathias, who died after an illness of four or five days, experienced no other

symptoms but severe pains in the calves of the legs and a suppression of urine. He had no nausea, he did not vomit. His mind was perfectly clear during the whole course of the disease, he noticed the continuance of the suppression of urine, dictated three or four letters to a friend, begged him to write rapidly the last, so that he might sign it, then devoted a little time to an affectionate intercourse with this friend, and soon after, unable to speak, he thanked the friend by a sign, and in a quarter of an hour he was dead.

This kind of latent condition of the yellow fever does not distinguish it from the acute diseases of Paris, which also are often obscure, and their symptoms mild. But it is remarkable on account of the rapid progress of the disease, usually fatal from the fourth to the sixth day. And this latent form reminds us at once of certain facts of poisoning by arsenic, in instances of individuals who have retained their clearness and calmness of mind from the moment of swallowing the poison until their death.

I add, that the severity of the symptoms does not correspond always with that of the lesions. Of these last, one only was constant, the specific alteration of the liver. The inflammatory state of the mucous membrane of the stomach comes next in frequency, and sometimes explains in a manner sufficiently satisfactory the symptoms that had been observed.

## SEC. II.—PATIENTS WHO RECOVERED.

In these patients the degree of the affection was very variable, so that in order to study the symptoms methodically, we must divide the cases into two classes, the one mild, and the other severe.

## 1. Severe Cases.

These cases, notwithstanding the title under which I arrange them, relate to individuals, who presented symptoms much less severe than those of whom I have just given some account in the preceding article. At the same time here, as in the other cases, the disease commenced with a chill, sometimes accompanied by shivering; headache, often intense; pain in the limbs. Heat succeeded to the chill, and at first it was quite high; the countenance usually was red, the eyes injected, suffused, more or less glistening, and this, immediately after the appearance of the first symptoms.

These last continued in a moderate degree, were complicated in a certain number of cases on the first, the second or the third day of the disease by vomiting, which was either spontaneous or excited by drinks, purgative or of other kinds. The epigastric pains were wanting in a greater number of cases; the pulse was moderately accelerated; the heat slightly increased. In some subjects the stools became black at a certain period of the disease,

towards the middle of its course, or a little later. The brown and black vomit occurred in the cases of a few individuals only, and these were mostly children. The redness of the eyes rarely increased after the first day of the disease, and on the contrary, it gradually became less. Restlessness at this period was rare. The extreme restlessness, the jactitation which took place in those who died, was not met with in any of the cases now under consideration, at least not in individuals whose cases we ourselves have observed, or whose histories have been communicated to us. This was not exactly true of the delirium. In a great many cases there was no yellowness, and in the majority of cases where it was found, it came on from the fourth to the sixth day of the disease. There was no spontaneous diarrhœa in any patient with whose history we became acquainted, and the abdomen preserved its usual form and suppleness, as in cases where the disease had a fatal termination.

At a period not far from the commencement, towards the fifth day, the symptoms became less severe; the skin became cooler; the pulse calm; the epigastric pain diminished or completely disappeared; the thirst was less; the appetite returned, and convalescence commenced. This was generally long, that is, in proportion to the duration of the disease, the mean duration of which was from seven to eight days. The strength was not perfectly

re-established sooner than from ten to twenty days after the cessation of the febrile symptoms, a period not in proportion, it must be allowed, to the presumed lesions, and to the time necessary to the complete re-establishment of the functions of the organs. And this fact shews, that if, as I have already said several times, the cause of the disease has a great influence upon the number and character of the symptoms, it has also an undoubted effect on the slowness with which the strength returns.

Here also another question presents itself, and one equally deserving an examination. The liver, as we have seen in the second part of this work, was more or less altered in all the cases where the disorder was fatal. Its alteration was of a peculiar character. Must we admit that this same alteration took place in all the cases where the patient recovered. It seems to me that an affirmative answer should be given to this question. We cannot object to it that in many cases there was no yellowness, because on the one hand, all of those who died were not yellow, although the peculiar alteration of the liver was found in every case, and because on the other hand, in the cases where the yellowness did exist, the alteration of the liver must have commenced sometime before the patient became yellow. To these considerations we must add that the alteration of the liver is the specific anatomical character of

the yellow fever, and we must believe that this same alteration, though undoubtedly in a less degree, existed in cases where the patients recovered, as well as in those where the disorder terminated in death.

## 2. Mild Cases.

These cases differed from those we have just considered not only in the mildness, but also in the smaller number, of the symptoms, and in the extremely short duration of the disease. Most commonly at the commencement, there were headache ; chills followed by a slight degree of heat ; pains in the limbs ; redness of the face and eyes. The epigastric pains were rare, and so too were the vomitings, which were almost never spontaneous, and which in no case were of a brownish color. The heat and the thirst were moderate, and so slight was the diminution of the strength, that the patients either did not keep their bed at all, or were there for half a day only, thus, according to their expression, going through with the disease on foot. In this form of the disease, they were able to escape the vigilance of the health inspectors, resuming familiar occupations, or playing on musical instruments, when these last made their visits. In several of these cases the febrile symptoms were very slight, continuing only during twenty-four or thirty-six hours. These persons were exempt from any other



disease in the course of the epidemic, although exposed to all the causes which could have produced in them the yellow fever.

This extreme mildness of the disease was not peculiar to the epidemic of 1828; for a considerable number of persons who were at Gibraltar during the epidemics of yellow fever which prevailed there in 1818, 1824 and 1828, continued to enjoy good health at these different periods, although they had experienced only what may be called a slight indisposition in the epidemic of 1804. To this we may add, that it was principally in children that the epidemic of 1828 put on this mild form, and in them the mortality was much less than amongst adults, as we shall see hereafter.

Here also, as in the preceding cases, the duration of the convalescence was long in proportion to that of the disease. The disproportion was even greater than in severe cases.

A relapse was rare; it took place where the disease had been violent, and then almost all the symptoms observed the first time, re-appeared. At least it was so in a great many cases. Errors of regimen apparently had much to do with these relapses, which were much more frequent amongst the soldiers; at any rate, the physicians who had charge of the two classes of patients agreed in saying so.

I shall now endeavor to ascertain the value of the symptoms which have been described in a general manner, and to accomplish this object, I shall not hesitate to go into numerous details. Amongst other things, I shall point out the proportion of cases in which these symptoms appeared. I shall compare the symptoms of the patients seen by M. Trousseau and myself with those which have been observed by our medical brethren in cases, the history of which, they have communicated to us. This parallel will make the description more complete, and it will be very useful in the solution of an important question, as we shall see hereafter.

I shall commence with the observations which we have taken ourselves, they being more detailed, and then I shall pass to those which have been communicated to us by Messrs. Aniel and Gilchrist, surgeons of the twelfth and forty-third regiments, and by Messrs. Dias and Mery, Spanish physicians.

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## ARTICLE II.

### HEADACHE.

#### SEC. I.—FATAL CASES.

In twelve of fourteen observations taken by M. Trousseau and myself, there was a more or less severe headache, and in two of them it was wanting.

In three cases it continued during the whole course of the disease, in the others only during the first half. In one it came on in the middle of the disease. Usually severe when it commenced, and sometimes accompanied by uncomfortable and violent throbbing of the temporal arteries, it diminished gradually. It was almost always the first symptom experienced by the patient.

We cannot attribute the headache to any appreciable morbid condition of the brain, which was usually natural, nor to the disease of the mucous membrane of the stomach, and this, for several reasons. In the first place, in almost all the cases this last affection did not come on until after the commencement of the headache, and in some cases a long time after its commencement. And then, the alteration of the mucous membrane of the stomach was considerable in cases where there was no headache. The headache existed only during the first half of the disease, whilst the affection of the mucous membrane increased every day.

This headache, then, was the first effect of the febrile movement, or of the cause, whatever that may be, which was acting on the economy, and no result of sympathy with a diseased organ. As to the patients whose histories have been communicated to us, in thirty-two of them, mention was made of pains of the head. Nearly all these patients suf-

ferred from headache at the commencement of the disease. It was more or less severe during the first half and then disappeared, as in patients whom we ourselves have observed.

An autopsy was made in so few of these cases, that we cannot compare symptoms with lesions. Still, when we come to the history of the symptoms proceeding from the digestive organs, we shall see that the preceding reflections are applicable here.

SEC. II. — PATIENTS WHO RECOVERED.

Fifteen of the patients observed by us, and into the state of whose heads we have inquired, were troubled with a more or less severe headache. In all, with one exception, it commenced on the first day of the disease, and, as in patients who died, the headache ceased towards the middle of the disease, or at any rate was more severe the first than the following days. Two patients going to bed perfectly well, the headache commenced in their sleep.

Twenty-one soldiers, whose cases have been communicated to us, and in which, mention has been made of the condition of the head, had headache. The same thing is true of nine patients in the city observed by Messrs. Mery and Dias, and in all, the headache had the same course as in the patients whom I observed myself, commencing the first day of the disease, with but one exception, and limited

to the first half of its course. Sometimes it was very severe. It decreased after the first twenty-four hours, and in some cases it came on subsequently to the chills.

The headache, then, was governed by the same laws in the course of this disease as in other acute diseases, where it is so frequently met with, by no means continuing through the whole course of the disease. But it was much more severe in the yellow fever of Gibraltar, of 1828, than in the acute diseases of Paris, whose seat is not in the brain, and this degree of severity gives it some importance.

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### ARTICLE III.

#### SLEEP.

##### SEC. I. — FATAL CASES.

Two patients observed by M. Trousseau and myself, were drowsy during the second half of their disease. In most of them, the sleep was inconsiderable, agitated, or disturbed by dreams.

Almost all those, whose cases have been communicated to us, had no sleep during the first night after the commencement of their illness; half of them enjoyed a little rest in the two following nights, the disease terminating fatally the fourth or fifth day.

In other patients the sleep was more or less incomplete, and somewhat uneasy during the whole course of the disease.

SEC. II. — PATIENTS WHO RECOVERED.

Of nine patients, in whom we investigated carefully the state of sleep or wakefulness, six had some rest towards the middle of the disease, after having been more or less unquiet during the night, up to that time. One of the three slept a little at an earlier period, but in the other two the sleep did not return except with the complete disappearance of all the other symptoms.

Half of the patients whose histories have been communicated to us, slept only during the second half of the disease. The sleep returned in the others at an earlier period, or else with the convalescence. Some of those whose illness was of from five to ten days duration, were drowsy at the commencement of their illness, and during about forty-eight hours.

The absence of drowsiness in almost all the persons attacked by the yellow fever of Gibraltar of 1828, as observed by ourselves and by the other physicians, is a distinctive difference between this disease and typhoid fever.



## ARTICLE IV.

## STATE OF THE INTELLECTUAL FACULTIES.

## SEC. I.—FATAL CASES.

Of fifteen patients observed by M. Trousseau and myself, seven retained the use of their intellectual faculties up to the fatal termination (2, 4, 9, 14, 20, 24), and one of these died at the commencement of the fourth day of the disease. The nine others were slightly delirious, but most of them during a little less than their last twenty-four hours. Three only exhibited this symptom before the period mentioned, two of them during the last forty-eight hours, and the third during the last three days of his illness, which proved fatal at the close of the fifth day (3, 5, 6). And in these last cases the delirium was slight, consisted of an incoherence and a confusion of ideas, and was not accompanied by cries.

Except a slight injection of the medullary substance in the last of these three patients, the brain was natural. In the two others, this organ was entirely natural, whilst in one of those who retained the free use of his mind to the last (23), the cortical substance was rose colored. The medullary substance was not much injected but in cases of the same kind. The cortical substance and the corpora

striata were of a slight rose color in one subject, in whom there was an alteration of the intellectual faculties the last day of life only.

We cannot then explain by the condition of the brain the alteration of the mind in the cases where it took place. Nor do we find any explanation of this alteration in the lesion of the mucous membrane of the stomach. These lesions were as common as the delirium was rare, and as marked in patients who retained the entire use of their faculties, as in those who were in an opposite condition. We may add to this that few individuals die of any acute disease without being slightly delirious the last day of their existence. Two of the eight subjects, whose histories we are now studying in an especial manner, were in this state, and of fifteen other patients three only had any important delirium. The same proportion prevails in other diseases, as, for example, in pneumonia. This fact is the more worthy of remark, since acute gastritis has been regarded lately as an almost constant and exclusive cause of delirium. It however, will astonish those only, who forget that delirium is extremely rare in those poisoned by corrosive substances, as any one may convince himself by the perusal of treatises on toxicology, that by M. Orfila in particular.

In one patient there was a little stupor, and as this was one of the cases in which the delirium was most marked, I shall give it to the reader.

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#### SIXTEENTH OBSERVATION.

ROBERT MILIGAN, soldier of the twenty-third regiment, of a strong constitution, and addicted to the use of spirituous liquors, had not left the Europa Flat, where his regiment was encamped, for three weeks, nor mounted guard for some time, when he became ill the 10th of December. The same day he entered the marine hospital, and he then presented the following symptoms; headache; pain in the back, in the legs and knees; the countenance red; the eyes much injected; slight stupor; the centre of the tongue white, its edges red; the pulse frequent and feeble; no vomiting; no diarrhœa.

Immediately at the commencement of the illness, Miligan experienced a violent rigor, followed by heat and sweat. A foot bath, three purgative enemata, an ounce and a half of castor oil, twelve leeches to the temples, friction of the legs and back with hot vinegar, were prescribed.

The 11th, the symptoms were the same as on the

preceding day ; the patient was costive ; an ounce and a half of castor oil was prescribed, and purgative enemata were given until numerous dejections were obtained. During the night, the patient was restless and delirious. The morning of the 12th, he was stupid and answered to no questions. His eyes and countenance were more injected than on the day before, the tongue dry, its point red, the skin dry and hot ; the pulse frequent and harder than on the preceding day. The dejections yellow. Calomel, James' powder, grains iij. every three hours ; three or four enemata ; the head to be shaved and cold lotions applied to it ; emollient drinks ; blister to the back of the neck.

The stupor was more marked in the evening ; during the night the patient was restless ; he had three yellow brownish liquid stools, and three or four vomitings, of which the last was brownish, and deposited a sediment like soot.

The delirium continued the 13th, the stupor was less ; the eyes injected ; the neck and abdomen yellow ; the pulse extremely feeble, eighty ; the skin supple, moist ; the heat slightly increased ; the respiration suspicious and plaintive. In the midst of questions addressed to him, the patient vomited without effort a brownish liquid, and he took care himself that it should be caught in the basin. He complained of a violent pain in the epigastrium ;

his tongue moist, its point red, the other parts of it natural. The teeth covered with sordes; the urine abundant; the stools liquid. Four ounces of porter; tea; an ounce of brandy if the patient desire it; an enema.

The vomitings continued, and became successively blacker in the course of the day. During the night the patient vomited three pounds of an extremely black fluid; there was hiccough during the four hours preceding the fatal termination, which took place the next day, the 14th, at ten, A. M.

*Autopsy four hours after death.*

EXTERIOR — An universal but slight yellowness; lividity of a clear rose color; cadaverous rigidity very marked; muscles of a vermilion red, of a firm tissue, well developed.

HEAD. — *Dura mater* yellowish; *sub-arachnoid* infiltration of the same color; *cortical* substance of the brain of a dark grey color; the *medullary* substance not injected; both of a remarkable consistence. A half ounce of serum in each lateral *ventricle*; the *cerebellum* in the same state as the brain.

SPINE. — The *spinal marrow* of its usual size; its cohesion greater than that of the muscles of the same subject, to which it was compared. The grey substance of a deeper color than usual.

NECK. — The mucous membrane of the *larynx* of a bright red color, not thickened ; that of the *trachea* and of the *bronchi* perfectly natural. The subjacent cellular tissue alone injected, and we found in it ecchymoses of a deep red color near the bifurcation of the bronchi. The *pharynx* natural, the *œsophagus* deprived of its epidermis through its whole extent.

CHEST. — The *pericardium* natural, and contained no serum. The *heart* larger by half than the fist of the subject ; its left ventricle hypertrophied, the right dilated, the usual thickness of its walls preserved. The cavities of this viscus contained neither liquid blood nor fibrinous clots ; their internal membrane perfectly natural. The *arteries* were not red in any point ; more yellow than natural. The *aorta* presented through its whole extent a multitude of spots, larger or smaller. Some of them were white, not prominent, and were owing to a simple opacity of the internal coat. The others were yellow, more or less prominent, and were owing to a kind of gelatiniform infiltration, which had taken place in the adherent face of the same coat. The middle coat was somewhat thinned in the corresponding points. The *lungs* presented some cellular adhesions. Their superior lobes were spotted with red spots, not moist, and with some demi-transparent grey granulations. Everywhere else, and especially behind, in the pul-



monary tissue we found masses infiltrated with blood, several of which were grouped together, and some touching each other. On the incision of these masses, there flowed a considerable quantity of blood. Those which were of the deepest red were easily torn. By pressing them in a basin of water, the blood could be squeezed out of them, and the pulmonary tissue recovered its usual color, suppleness and cohesion.

ABDOMEN. — The *stomach* slightly distended; contained a pound of a thin soot-black liquid, without clots. This liquid was turned into a vessel, and the mucous membrane with which it had been in contact, was thinly covered by a blackish sediment, easily washed off. This membrane was of a greyish tint, except towards the middle of the posterior face of the stomach, where it was of a rose color. It was universally mamelonated, and it was nearly twice as thick as usual, except in the great cul-de-sac. Its consistence generally was good; its strips were from twelve to eighteen lines long near the small curvature, from four to five in the middle of the great curvature, from one to two in the great cul-de-sac, from six to eight near the pylorus. The *small intestine* contained a matter similar to that found in the stomach, and of the consistence of thin fruit jelly. Its internal membrane was yellow through its whole extent, of a less consistence than usual. It gave strips of from four to six lines in

length, and of two lines only in the last half of the ileum. *Brunner's* and *Peyer's glands* presented no appreciable alteration. The *large intestine* contained a small quantity of black matter, of the consistence of healthy fœcal matter. Its mucous membrane was universally of a delicate rose color, except in the rectum, where it was of a bright red. It was thicker than usual, and much softened; its strips were only of from two to four lines in length. The *liver* was of its natural size, consistence and cohesion. Its great lobe was yellow through its whole thickness, and presented numerous red granulations. These granulations did not exist in the left lobe, the color of which was almost precisely that of table mustard. The *gall bladder* contained a spoonful of green and living membrane slightly viscous bile. Its walls and that of the *biliary ducts* were natural. The *kidneys* and the *bladder* were not remarkable. The *spleen* was less coherent than natural.

We find here, together with the most characteristic symptoms of the yellow fever, two others which are not usually met with, delirium and stupor. As we have not met with the stupor in any other case, the presence of it here is the more remarkable. This patient experienced at the commencement of his disease violent chills, soon followed by heat and sweat; soon after, the same day even, headache,

pain in the back and limbs, a slight stupor. The next day the patient was in the same condition, and in the night of the first and second days, or from thirty-six to forty-eight hours after the attack, the stupor was increased, a slight delirium supervened, and to these two symptoms the black vomit and yellowness were soon added, which continued even on the last day, at which time the patient alone, and without assistance, took the necessary precautions, so as not to soil his bed when he vomited. At the autopsy we found the brain firm, the cortical substance of a deeper grey than usual, a condition which cannot be considered as evidently pathological. The medullary substance was perfectly natural. Here again, as in other cases, we cannot explain the delirium by an appreciable pathological condition of the brain. Nor can we attribute it to the inflammation of the mucous membrane of the stomach; for if the severe epigastric pain of the last day indicated an exasperation of the inflammation, the perfect appreciation of this exasperation by the patient, denoted a restoration of mind, and this, undoubtedly, could not have taken place, if a less degree of inflammation had been the cause of the delirium.

The epigastric pain is not the only symptom worthy of attention. The abundant vomitings are not less so. We should notice especially, that the vomitings took place without effort, and as it were, caused by

a mechanical power extraneous to the patient. We ought not to pass over in silence, the slight degree of prostration at the time of the abundant vomitings, and so near to the fatal termination, when he himself held the basin in which he vomited, and was careful not to soil his bed.

As to the lesions, that of the mucous membrane of the stomach was remarkable for its extent, and not for its degree, which was inconsiderable. The condition of the liver was not different from what we have observed in other cases.

But let us return to the analysis of our facts. Of thirty-three patients not observed by us, and in whose histories mention has been made of the mental condition, twelve, or a little less than a third part, had delirium, four, during the last two days of their lives, the others during the last day or only during the few hours immediately preceding the fatal termination. Thus, in these patients the delirium came on nearly in the same proportion to their number, and at the same period of the disease, as in those observed by ourselves, so that the delirium must be considered an accidental symptom, and in most of the cases, a phenomenon of the agony. It may be remarked also, that the four patients who were delirious in the last two days of life, were the most robust, and amongst those whose treatment

was the most energetic, or to make use of a more correct expression, the most exciting.

If then, the delirium must be considered accidental, if it is in no way characteristic of the yellow fever of Gibraltar of 1828, if it is to be regarded as independent of this disease, the same is not true of another symptom, the different degrees of which form what has been called *malaise*, anxiety, restlessness, jactitation. The anxiety and the restlessness were really great in five patients, whose histories we have taken, during the latter half of the disease (1, 2, 3, 20, 24), and still more considerable in four others whom we have not dissected, in two of whom the symptoms appeared very soon after the attack.

In the acute diseases of Paris, we do not nearly as often find that state of anxiety, and this makes me regard it as characteristic of the disease we are studying.

I must however remark, that the *malaise*, the anxiety, the restlessness, have not been noted in any of the ten cases which have been communicated to us by the city physicians, whose treatment was much less stimulating than that of the army physicians. Still, though these histories have been taken with care, yet, as we shall see by what takes place in patients who recover, it would be very rash to attribute this difference of the symptoms to a difference of treatment.

To this we may add, that in all the cases where we have observed a state of *malaise*, or an anxiety more or less considerable, the mucous membrane of the stomach was incontestably inflamed, and this inflammation doubtless had much to do with the development of the phenomena we are studying. To be sure, we can easily conceive that an uninterrupted stimulating treatment in this condition would produce the greatest anxiety.

SEC. II.—PATIENTS WHO RECOVERED.

No one of the patients, whose histories were taken by M. Trousseau and myself, was delirious, and only two were restless and anxious. And it is somewhat remarkable, that patients with a red swollen face should preserve their faculties during the whole course of the disease. This may be regarded as a new proof of what has been said before, that delirium in patients who died was an accidental superadded symptom.

As to those whose histories have been communicated to us, out of thirty-four, where the condition of the mind was noted, five were delirious. The disease in these cases was slow, convalescence commencing the ninth or tenth day, and though in all these the skin and eyes were yellow at a certain period, we may have some doubts as to the character of the disease, certainly in the most protracted cases.



For my own part I am inclined to think that, instead of the yellow fever, they had some other disease, perhaps typhoid fever, but I am not sure of this, because the observations contain so few details that we cannot form an opinion with any certainty of its correctness. Under any consideration, it is probable that this difference between observations communicated to us, and those we ourselves have taken is rather apparent than real.

There was restlessness and anxiety in five of these cases, either at the commencement or towards the middle of the disease.

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## ARTICLE V.

### PAINS OF THE LIMBS AND BACK.

#### SEC. I. — FATAL CASES.

All of the patients whose histories we have taken, with but one exception, experienced more or less acute pains in the back, limbs, or loins; usually in several of these points at once. These pains came on the first day of the disease, either before or after the chill, in all the patients except three. They continued in various degrees, through the whole course of the disease in two cases (21, 19); two or

three days only in three others (4, 5, 9), and in the other patients they existed during twenty-four hours only. It was expressly said, that in several of these patients these symptoms did not exist during a longer time.

One of these had cramps in the calves of his legs ; in another, with pains in the loins, there was a sensation as of a liquid running down the back.

What was the cause of these pains ? We cannot attribute them to any appreciable lesion of the muscles of the parts which were the seat of them, these muscles not being unnatural, with but one exception. Nor is it possible to attribute them to a sympathy with organs more or less distant, for instance, with lesions of the mucous membrane of the stomach, for, on the one hand, these lesions were not found in all the cases where the pain existed, and on the other hand, their course was very different from, nay, the opposite to that of these lesions. These last commenced some time after the attack of the disease, making daily progress, whilst the pains were one of the first symptoms, diminishing usually after the first twenty-four hours, and rarely continuing through the whole course of the disease. In the case where the sensation of a liquid running down the back was added to the pains of the loins, the spinal marrow and its membranes were natural, the spinal arachnoid containing about four spoons full of liquid, a quan-

tity but little greater than that which we have found in other cases, and to which, consequently, we cannot attribute this sensation.

However, it is possible, as we shall see when we speak of patients who recovered, that the pains of the back might have been in some cases, in part at least, produced by the inflammation of the mucous membrane of the stomach.

All the patients, whose histories have been communicated to us, suffered from pains in the back, in the limbs, or at least in the loins. This is true of twenty-four cases where inquiry was made about these pains. They came on, with two exceptions, the first day of the disease, and, as in patients observed by ourselves, they were felt in the different parts at the same time. In some cases all the joints were painful, in others the loins and the limbs. The pain was referred to the middle of the back in twelve cases, amongst which there were several relative to individuals who had no pain in any other part. These pains were confined to the calves of the legs, and preceded the appearance of gangrene, there in a case collected by M. Dias, the only one in which it was possible to attribute the pain to the condition of the organ which was really the seat of it.

The pains, very severe in some cases during the first hours of the disease, diminished a little later, so as not to occupy the attention of the patients.

## SEC. II. — PATIENTS WHO RECOVERED.

These patients experienced pains similar to those of which we have just spoken. Thus, in patients, whose histories we have taken, these pains existed in the limbs, the loins, and usually in all these parts at once. In four patients they were very severe, three of whom suffered only in the dorsal region. These last vomited and suffered from pain in the epigastrium, at the period when the pains of the back were the most severe, so that we are led to believe that the inflamed mucous membrane of the stomach was, in part, if not wholly, the seat of these pains.

In four patients not observed by us, they were violent, and in three of them they were referred principally to the dorsal region. One of the patients was at the same time anxious, and complained of pains in the epigastrium.

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ARTICLE VI.

## MUSCULAR FORCE.

## SEC. I. — FATAL CASES.

Twelve of the patients whose histories we have taken, and who died the fifth or sixth day of their

illness, became quite weak as early as the second day (4, 20). In the others the prostration was slight, and two others dying at the same period, experienced scarcely any prostration up to the time of their death (14, 23). These really insidious cases were not infrequent, as we have already seen, and as we shall again have occasion to see.

As regards the strength of the patient, the yellow fever of Gibraltar, of 1828, does not resemble the acute diseases of Paris, certainly not the typhoid fever, one of the principal symptoms of which is the prostration. Then the cause of the yellow fever, the importance to be attributed to which in the explanation of the death of patients attacked by this disease, we have seen in the first part of this work, does not act in paralyzing and destroying the strength, but in some other and, as it were, a more deleterious manner. We may remark also, that if the loss of strength was inconsiderable, this fact is in harmony with the condition of the organs, the lesions of which were usually much less severe than in individuals dying of other acute diseases.

Five patients, whose histories were not taken by ourselves, experienced a great debility the first day of the disease, but this debility continued through the whole disease in one case only. In a sixth case it was considerable during three days. In the last half of the fever the weakness was moderate; and

out of proportion to the severity of the disease in several patients, who left their beds for their dejections almost to the last moment.

SEC. II. — PATIENTS WHO RECOVERED.

Of fifteen patients whose entire histories were taken by ourselves, three experienced a considerable prostration the second, the sixth, and the eighth day of the disease, from which they were convalescent, the ninth and tenth days, that is to say, at a later period than its average duration, which was only seven days, as we shall see hereafter.

The weakness existed to a remarkable degree in twelve subjects, whose histories have been communicated to us. The proportion of severe cases is greater here than in the sum total of the cases, for one of the gentlemen who kindly communicated to us observations, took the severe cases, choosing them as the more interesting. In five of these twelve patients the weakness was very marked as early as the first day of the disease. One only had black or chocolate colored vomitings, from fifty to seventy-two hours after the commencement, and the greater part lost a great deal of blood from the alimentary canal, the gums, or other parts of the mouth. These hemorrhages usually explained satisfactorily the duration of the weakness, and, in some



measure that of the disease, which was much longer than the average term in most of these patients.

The analysis of these cases then, does not contradict the conclusion which we have drawn from another order of facts that the cause of the yellow fever of Gibraltar of 1823, did not act in prostrating the patients.

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## ARTICLE VII.

### THE SENSES.

#### SEC. I.—FATAL CASES.

The hearing preserved its acuteness in all the cases in which we were able to ascertain exactly its condition. Ringing in the ears existed on the second and third days of the disease in one patient, whose illness lasted four days and a half. There was no other example of this symptom.

The sight, properly speaking, was not affected, although the suffusion of the eyes and the sensibility to light were rather frequent. We found the conjunctiva more or less injected in all the cases where it was examined at a period near the commencement of the disease. It was so the first day of it in a patient, who was brought to the marine hospital soon after the appearance of the first symptoms, at a time

when we were there, and in whom the injection increased progressively up to the fatal termination (16). This injection was found the second day of the disease in all the patients who were examined at that period, and very probably it came on, as we shall see hereafter, at the commencement of the disease. Its duration was not always the same; generally less than that of the disease, it was of one or two days only in two cases (9, 14).

In most instances the redness had a double character, sometimes being of a uniform delicate rose tint, as if put on with a brush, and sometimes there being a more or less marked injection of the vessels of the conjunctiva. In the cases where the redness had not disappeared at the time the yellowness came on, the mixture of yellow and red in the sclerotic was very remarkable.

There was no epistaxis in any case. This fact is remarkable in a disease where the disposition to hemorrhage was so great, and the more remarkable, since epistaxis is frequent in other acute diseases where no such disposition exists, as in typhoid fever; so that in the absence of epistaxis, we have something distinguishing yellow from typhoid fever.

In patients, whose histories were not taken by ourselves, the state of the hearing has not been mentioned. The same is true of the eyes, except as to their color, which was the same as in patients

under our own observation. The uniform rose tint was not distinguished from the injection, but the redness of the conjunctiva was mentioned in all the cases, where the patients were observed the last day of life. In sixteen of these, it was more or less vivid the first day of the disease. In one patient observed by M. Dias, it existed four hours after the commencement of the illness.

There was no epistaxis, or at any rate, no mention has been made of it, except in the case of a soldier of the second regiment, who died the fifth day of the disease.

#### SEC. II. — PATIENTS WHO RECOVERED.

As the patients who died, so those who recovered and whose histories we have taken, preserved the acuteness of the hearing during the whole course of the disease, and the eyes of all were more or less red. And this redness presented itself under two different forms ; usually both forms existing together. It was observed the first day of the disease in all the patients, whom we saw at this early period. Nor had it entirely disappeared, except in a few cases, at the time of convalescence, wherever the disease had a rapid progress, and the symptoms were not very severe. Usually the eyes were at the same time more or less glistening, moist and suffused, frequently sensible to the light, but rarely what may be called

painful. This last symptom has been noted once only.

In all the cases, which have been communicated to us, the eyes were red, and they were so the first day of the disease, at the entrance of the patients into the hospital, or in private patients at the first visit of the physician, which usually was a few hours after the attack. The redness diminished as early as the second or third day in many cases. In others less numerous, it increased during the first forty-eight hours.

In four patients there was epistaxis the fourth, fifth and sixth days of the disease, the duration of which was from eight to thirteen.

The facts presented in this article are important, for on the one hand, the absence of ringing in the ears, and the preservation of the acuteness of the hearing even where the disease was long, constitute a marked line of distinction between the yellow fever of Gibraltar of 1828, and typhoid fever, in which the ringing of the ears and the dulness of the hearing are so common; and on the other hand, the redness of the eyes in all the cases at the commencement of the yellow fever, distinguishes it from those acute diseases of Paris, whose course is most rapid. This redness must then be considered one of the most valuable diagnostic symptoms of the yellow fever.

I purposely avoid speaking here of the yellowness of the eyes, a color which is very important in the diagnosis, and which I shall treat of hereafter with the facts relative to the yellowness. I may remark, that the early appearance of the redness of the eyes, and its importance as a symptom, entitle it to be placed in the first rank.

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## ARTICLE VIII.

### CHILLS, HEAT, PERSPIRATION.

#### SEC. I. — FATAL CASES.

Chills occurred in all the patients whose histories we have taken, and of whom we have inquired as to their occurrence. They took place in two of the cases on the second day of the disease, in the others at its very commencement. In half the cases, the chill was accompanied or followed by shivering ; occurring once only in most of the patients, the chill came on several times a day in one of them, three successive days, commencing on the first, in a second patient who died the fifth day of the disease (3). And they took place the second, third, and fifth days in one case where death occurred from an accident the eighteenth day.

Heat succeeded to the chills. It was generally

slightly increased, less considerable than in several of the acute diseases of Paris. It was nevertheless considerable in four patients, during almost the whole course of the disease, and in two others during forty-eight hours. Almost always natural, in three cases it left the extremities before the agony, sometimes one day, sometimes a longer time before the fatal termination. In these cases we have more than once found the temperature of the limbs below that of the part of the bed where they were lying, so that in touching them we experienced a disagreeable sensation of cold.

We have noted sweats in six cases only, and once only in each of these cases, with one exception, a soldier, of whom mention has already been made, and who was carried off the eighteenth day of his disease, by an infiltration of urine. He had copious sweats the third, fourth, fifth and sixth days.

In patients whose histories have been communicated to us, chills came on at the commencement of the disease, and their absence has not been mentioned in any case. The same is true of their return; nevertheless this does not prove that each of these individuals had one chill only. How many facts of inferior importance must have escaped men whose zeal was beyond their strength, and who day and night were in the midst of the sick and the dying.

The state of the heat was nearly the same as in



patients observed by ourselves, so that amongst twenty, in whom the temperature of the body was observed and noted, commencing with the first or second day of the disease, the heat was considerable in six, and natural in three. In the others, it was slightly increased, dry or moist, and in those cases where it was greater than natural, it fell rapidly, so that in nine patients dying from the fourth to the ninth days of the disease, it fell below the natural standard, two, three, four days before the death.

More or less profuse sweats were observed in six cases, the first day of the disease in four patients, the two first in a fifth, the first and fourth in the last.

#### SEC. II.—PATIENTS WHO RECOVERED.

Chills took place in all the patients whose histories we have taken, and were repeated several times the first day of the disease in two cases. They took place only several hours after the appearance of the first symptoms in one case, and succeeded the headache in another.

The heat was considerable in four cases ; the two first days of the disease only in half the cases, these patients being convalescent from the fifth to the eighth day. In another patient it was slightly increased or almost natural during the whole course of the disease. Nine of these fifteen patients had sweats, either the first or the following days, but they were copious in one patient only.

All the patients, whose histories have been communicated to us, had chills at the commencement of their disease, and two of them experienced these chills the ninth or tenth days, five days before their perfect convalescence. The heat was rarely very much increased in these same patients, so that this character was noted in three cases only, and during two or three days at the commencement of the disease.

There were sweats at different periods in some subjects ; they were copious in four only.

Thus both in patients who died, and in those who recovered, chills took place at the commencement of the disease, and were rarely renewed afterward, more rarely than in the acute diseases of Paris ; a difference which cannot be owing entirely to the difference of climate. We may here express our astonishment at the attempts of physicians to connect yellow with intermittent fever, there being little analogy between the two diseases. The heat was rarely considerable. In several fatal cases there was a diminution of the temperature, one, two, and three days before the fatal termination. The state of the heat, then, in yellow fever patients, is very different from what we observe in those suffering under other acute diseases, in which the heat is greater, and does not diminish so rapidly. Nor does the diminution take place only partially a long time before the fatal termination.

At any rate, we should remark that this loss of heat took place nearly at the time of the gastrointestinal hemorrhage, that this hemorrhage must be taken into the account in any explanation we may make of the phenomenon, although, as I have remarked in the second part of this work, it cannot be considered one of the principal causes of death, and individuals who have recovered after more considerable hemorrhage from other organs, did not lose their heat in a similar manner.

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## ARTICLE IX.

### STATE OF THE PULSE.

#### SEC. I.—FATAL CASES.

In patients whose histories we have taken, the character of the pulse was in harmony with the febrile symptoms of which we have just spoken. Its frequency was moderate, so that in no case did it beat oftener than a hundred times a minute, and we found it so frequent in only five of those patients who were properly observed with reference to this, and then at various periods of the disease, and during one day only. It was thus frequent the second, third, fourth and fifth days in patients who died from the fifth to the sixth days. Previously it had beat

eighty times a minute. To mention two cases only, it was at eighty-eight, one hundred, eighty-eight, seventy, the second, third, fifth and sixth days of the disease, in a patient who died at this last period. It was at eighty and seventy on the third day and on the last day of the disease, in a patient who died at the same period as the other, or only a few hours earlier.

As to the force or size of the pulse, in eight cases it was noted exactly. In one of them it was large and vibrating (19), a little stronger than natural in two others, almost natural in a fourth and fifth (2, 1), small, serrated, and almost uninterruptedly so, in the three last.

The patients in whom the pulse had this last character were not of the number of those who were anxious. One of them experienced but a very slight prostration, had no headache, and hardly any pain in his limbs. Another was prostrated as early as the second day of the disease, and on the fourth day despaired of recovery (4); the third was delirious the two last days of his life (16). In all, the stomach contained more or less black matter; its mucous membrane was more or less inflamed. The vomitings were numerous in one case only (4). The condition of the heart was not always the same in these patients; small, otherwise healthy in one of them, it was rather large and flaccid in another (14);

the left side slightly hypertrophied and dilated in a third (16); and, finally, in the case where the pulse was vibrating, the heart was not remarkable, and the mucous membrane of the stomach had undergone the same alteration as in the three patients to whom we have just referred. Thus, whilst on the one hand, the inconsiderable frequency of the pulse and the slightly increased heat denote a slight reaction of the artery, the independence of the pulse, as to its fulness or force, of the state of the heart and stomach, seems to shew that the cause of the disease had some influence in the production of these different characters. So that the further we advance in the study of the symptoms, the more confirmation we find of what has already been said at the commencement of this work, as to the action of the cause of yellow fever on the economy, independently of apparent lesions of the organs.

Six of the patients whose histories have been communicated to us, had an unequal pulse the first, third, or fifth days of the disease. Its size has been noted in one case only, but for reasons already given, this does not prove that it was not remarkable in some cases.

#### SEC. II.—PATIENTS WHO RECOVERED.

The pulse was but slightly accelerated in the patients submitted to our observation, and its frequency

diminished progressively from the second day of the disease in all those, six in number, whom we have observed from the commencement, so that it passed from a hundred, or ninety pulsations in a minute, to eighty or seventy-five. We should remark also, that the progress of the disease was rapid in these six cases, the convalescence taking place four or five days after the commencement. But we must not conclude from this, that the rapidity of the pulse was always proportionate to the length of the disease. In two patients, who were convalescent the twelfth day, the pulse was scarcely accelerated during the three first days. As to the other characters of the pulse, it was large and rather full the second or third days of the disease in half the cases; small and feeble the first days only in two cases; it was natural, excepting in the acceleration, in the other cases.

In patients not observed by ourselves, the acceleration of the pulse did not continue longer than two or three days, except in the cases of two individuals whose disease was severe, and who were convalescent the ninth and twelfth days. The pulse was generally regular. It became unequal, irregular, or intermittent, the fourth day of the disease in the two cases, of which we have just spoken.

As to the force or weakness of the pulse, it was generally hard and full at the commencement, during



twenty-four or forty-eight hours. It was very feeble in a few individuals only, whose disease was prolonged, and then in the second half of the disease.

In patients who recovered, as in those who died, the reaction indicated by the state of the pulse and the skin was inconsiderable, and the slighness of the reaction would seem to shew that the nature of the disease was very different from that of the acute diseases of Paris.

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## ARTICLE VIII.

### EPIGASTRIUM.

#### SEC. I. — FATAL CASES.

Of twelve patients who died, whose histories we have taken, and in whom we have examined the state of the epigastrium at the different periods of the disease, eight complained of pain there as early as the first day; the others the second or fourth days. These pains were more acute the second day of the disease in one case, where they came on at the commencement (4). They were still more severe the fourth and last days in a second; very slight and excited by pressure only in two cases; compared to a sensation of fulness in one case (16). The epigastric pains were under the

form of cramps in one case, coming on the first day (5). They had no particular character in the other cases.

Their seat seems to indicate that they were caused by an alteration of the mucous membrane of the stomach, which was more or less inflamed in all the cases where they were present, excepting one where the disease was long. This proposition admitted, it would seem to result that the inflammation of the gastric mucous membrane commenced with the first symptoms in two of these eight patients. This, however, does not follow necessarily, for many patients complain of epigastric pains, at the autopsies of whom we find no appreciable lesion of the mucous membrane of the stomach. We have another reason for doubting the exactness of such a conclusion, since, as I have said in the second part of this work, the mucous membrane of the stomach was natural in one fifth of the cases, so that these lesions must be regarded as secondary, and not as essential, but as developed subsequently to the commencement of the first symptoms. It appears to me that this reasoning is incontestable, for in so short a disease as the yellow fever, secondary symptoms may develop themselves so rapidly, as to appear to date back to the commencement of the disease, whilst, in reality, they are posterior to it by a greater or less period of time.

To this we may add, that if the mucous mem-

brane of the stomach was natural in one patient, whose epigastrium was indolent, it was as much inflamed as in any other patient in two individuals who had never experienced any pain there, so that we cannot infer, from the absence of pain in the yellow fever, the non-existence of inflammation of the stomach.

It should also be remarked that, other things being equal, the epigastric pain was more frequent and more severe in patients dying of the yellow fever of Gibraltar than in those who die of other acute diseases, in which the mucous membrane of the stomach is inflamed. This too is a fact, which we can understand only when we recollect that delirium is frequent in these last cases, which prevents the perception of the painful impressions, and that delirium is infrequent in the course of the yellow fever of Gibraltar.

There was no difference as to the epigastric pains in the patients whose histories have been communicated to us. Of fifteen patients, respecting whom the existence of these pains was inquired into with care, five had none. In two other cases, they appeared with the first symptoms, in the rest of the patients, on the second or fourth days of the disease. In three cases they were dull, and in one of them, at an advanced period of the disease, they were burning. Generally they were slight.

Two patients, observed by my friends, experienced a burning sensation along the œsophagus, the day before or even the day of their deaths. No autopsy of these patients having been made, we have no positive information of the cause of this sensation. Was it in consequence of a rapid disappearance of the epidermis covering the mucous membrane of the œsophagus.

SEC. II.—PATIENTS WHO RECOVERED.

The state of the epigastrium was carefully examined in ten patients whose histories we took. Five of them suffered very acute pain at the commencement of their illness, these pains were acute the fourth day in one patient, always inconsiderable in the others. Two of these patients had vomited spontaneously, and the combination of these symptoms in the same patient will not allow us to doubt of the existence in this case of an inflammation of the gastric mucous membrane. The other three patients vomited, but not spontaneously, and in those who vomited spontaneously, without epigastric pains, we know not what to say of the cause of the vomiting. At the same time we cannot well doubt that an inflammation, more or less severe, of the mucous membrane of the stomach existed in more than two of these ten cases, this inflammation, like all others, being sometimes latent.

The state of the epigastrium has been mentioned in four soldiers, whose histories were not taken by ourselves. There was pain in all as early as the first, the second, or the third day of the disease.

If the absence of any remark on the condition of the epigastrium in the other soldiers, does not prove that it was indolent in all of them, we may infer that the pain was inconsiderable in these cases, without which it would have drawn the attention of the patients, and thus that of the physicians, who would not have failed to have mentioned it in their notes. It is the more probable that some pain existed in a part of those cases where no mention has been made of it, since it was observed less frequently by Messrs. Mery and Dias than by ourselves. Of nine patients, of whom they inquired respecting the existence of these pains, four had them in sufficient degrees of severity, although the treatment of these gentlemen was much less energetic than that of the military surgeons. We may add, that the epigastric pain was not very considerable in any case, and that it commenced the first or the second day of the disease.

Spontaneous vomitings took place in several cases where there were epigastric pains, and in others where there were no pains. The remarks which have been made above, may be applied here also.

Thus the epigastric pains existed in patients who recovered, as well as in those who died, and in a

considerable number of them. They were somewhat more severe, and rather more frequent in these last than in the first, a difference which exists in almost all the symptoms in every kind of disease, and which for that reason may easily be foreseen.

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## ARTICLE X.

## VOMITINGS.

## SEC. I.—FATAL CASES.

Thirteen of fourteen patients, whose histories we have taken, vomited. The commencement, the duration and the nature of these vomitings varied very much.

They took place as early as the first day of the disease in five cases, from five to twelve hours after the commencement; and were spontaneous in three of them; they were excited by bouillon or castor oil in two others. In the other cases they commenced the second, third, fourth and fifth days of the disease; in two of them they were excited by castor oil, or something else; in six others, who vomited the day of or the day preceding their death, they were spontaneous.

As to their duration, they were repeated every day in the cases where they commenced the first day of the disease, at first clear, then more or



less yellowish, blackish, and also completely black, as I shall soon have occasion to shew. Again, they took place every day, counting from their appearance on the second day of the disease, in one patient, who died towards the close of the fifth day. It was not the same with the others, so that, for example, one of the two who died after an illness of six days, vomited only on the second and third days.

The color of the vomit was brown or black in eight cases. Two patients, in whose stomachs we found a considerable quantity of black matter, had never vomited. The vomiting came on thirty-six or forty-eight hours before death in two cases, the last day of life in the others; and several patients appeared to vomit without effort, the basin being placed on the edge of the bed, and their heads supported on their hands.

The black matter resembled, except in its liquidity, that which I have described in speaking of the stomach, and like that, subsided, on standing, into two parts, so that it is unnecessary to speak of it here more in detail. We found also in the stomach of one or two patients who vomited in the last days of life, clotted or liquid blood only, a fact which would seem to shew that the black matter is nothing but fluid blood, altered according as it had remained a longer or shorter time in contact with the mucous membrane of the stomach (15). It is very remark-

able that there was no vomiting of red blood in any case, and yet we can hardly suppose that in the greater number of cases the blood exhaled in the stomach could remain there long without exciting vomitings. We should recollect here what has already been said, that the loss of warmth in the lower extremities coincided usually with the earliest black vomiting, and probably took place simultaneously with the hemorrhage of the stomach. This loss of heat did not take place in three cases where no black matter was found in the stomach (14, 23, 24), and in these same cases there was hemorrhage in the intestines. It would seem then that we cannot attribute the loss of heat to the exhalation of blood, independently of the organ in which it took place. Still, if any are disposed to conclude that this loss of heat is fully explained in this way, I would call their attention to the observation I am about to give, and to the remarks which follow it.

In other respects there was a sufficiently exact correspondence between the vomiting and the state of the mucous membrane of the stomach, in the fourteen individuals whose cases I am now studying, so that, with one exception, the vomitings took place in those individuals only, whose gastric mucous membrane was inflamed. And this case is hardly an exception, for the patient vomited the last day of life, and after having eaten an egg (23). One of the

subjects whose stomach was perfectly natural, did not vomit at all at any period of the disease.

One fact in particular of those which have just been considered, must have struck the reader, I mean the frequency of the vomitings in these fourteen cases; a much greater frequency, considering the number of the patients whose gastric mucous membrane was inflamed, than in other acute diseases, especially than in severe fevers, where the vomitings are as rare as the delirium is common, although the mucous membrane of the stomach is often inflamed. This is a new proof to be added to others, of the influence of delirium on the symptomatic expression of a disease. But let us pass on to the fact just alluded to, of an individual who died, not having vomited.

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#### SEVENTEENTH OBSERVATION.

PAPA, sergeant of the ninety-fourth regiment, became ill at Rosia, where he was stationed. He remained at home nearly four days, his wife having already had the yellow fever, and he was brought to the Windmill Hospital December 3d, 1828, the fourth day of his illness. Some purgative medicine was

administered as soon as he arrived. The next morning, at ten o'clock, the yellow tint was general, rather deep; the countenance pale; air of prostration; the answers exact when the attention of the patient was fixed, but he soon relapsed into a state of quiet delirium. He was bleary-eyed; his respiration was suspirious, quick, sudden, followed by a long expiration; hiccough; the skin cold; the pulse slightly accelerated, scarcely perceptible; the teeth covered with sordes; the tongue red, dry, horny, its edges and point smooth and dry; the abdomen indolent; the thirst burning. During the night the patient had three stools, of a deep olive green. No headache; no pains in the back or loins; no vomiting, no nausea; he had experienced nothing of the kind since the commencement of the disease. Blisters to the thighs, and tea for drink, were ordered. The urine was suppressed in the evening; no vomiting, no dejections, no delirium.

The 11th, the symptoms were the same as on the day before, only the yellowness was more marked, the mind less confused; the patient believed himself better, and expressed a wish to know about his wife. Sinapisms to the feet; blisters to the calves. He died that same evening at nine o'clock.

*Autopsy fifteen hours after death.*

EXTERIOR. — Universal light yellow color of the skin, deeper on the limbs than on the trunk, and

much deeper than on the face and neck. No traces of black vomit on the lips; *muscles* slender.

HEAD. — *Dura mater* yellowish. A spoonful of liquid serum in the lateral *ventricles*. Nothing else remarkable.

The *spine* was not examined.

NECK. — *Pharynx* natural.

CHEST. — The *lungs* free; the inferior lobes more consistent, more easily torn than natural. On making incisions in them, a black blood flowed out, and the surface of the incisions was marbled with cherry red and with dark red. The pulmonary tissue was the more easily torn, as its color was deeper. Pressing quickly on it, it was reduced to pulp. When the pressure, though strong, was gradual, the blood escaped, and the lung collapsed without breaking. A mass, as large as a hen's egg, and in the third degree of pneumonia, existed in the middle lobe of the right lung. The *heart* perfectly natural. A small clot, found in the right cavities, was broken down by the slightest pressure. The *aorta* contained a good deal of black and fluid blood, and its walls were of a deep yellow color.

ABDOMEN. — The *oesophagus* of a bright red near the cardia, everywhere else of a yellowish white, and the epithelium uninjured through its whole extent. The *stomach* of a moderate size, and containing four ounces of a deep yellow liquid, from which there

subsided a black substance resembling soot and water. Its mucous membrane of a greyish yellow, except in the space of a square inch near the cardia, and on its anterior face, where the folds were of a bright red color, and except on its posterior face, where it was of a bright rose color in the extent of about four inches. No mamelonated appearance; its consistence and thickness normal through the whole extent, except near the pylorus and along the great curvature, where its strips were only four lines in length. The intestinal canal distended by gas. Between the jejunum and the sigmoid flexure of the large intestine we found four pounds of a black fluid. The mucous membrane of the *duodenum* was not remarkable, except in a space of an inch and a half in diameter around the mouths of the biliary ducts, where it was red. That of the *jejunum* and the ileum was generally of a pearl grey color, sometimes shaded with yellow. Its thickness was natural; its consistence less than natural, so that by traction, strips of from two to three lines only were obtained. *Peyer's* and the *mesenteric glands* were not remarkable. The mucous membrane of the large intestine was of a greyish color and a natural thickness. Its consistence slightly diminished; it gave strips of from four to five lines only, as far as the sigmoid flexure of the colon, where its firmness became natural. The *liver* flaccid and not easily torn.



Its size natural ; its color a buff yellow, or that of sole leather without the slightest mixture of red ; granulations of a lemon yellow were disseminated throughout the parenchyma of the organ. The *biliary ducts* natural. The *gall bladder* contained about an ounce of a very thick matter, resembling pitch, giving a beautiful green color to the water in which it was dissolved, the black matter of the intestine communicating a brown color. The *spleen*, the *kidneys*, and the *bladder*, were natural.

Thus, as we have said, the mucous membrane of the stomach was nearly natural, and presented only a slight softening through a small extent. There were no vomitings. This cannot be attributed to the delirium, which was momentary. The disease was well marked in other respects during life, as well as after death ; in the first, by its rapid progress, the yellowness, the smallness of the pulse, and the loss of warmth thirty-six hours before the fatal termination ; and after death, by the presence of the black matter in the intestine and the specific color of the liver.

The patient did not vomit, scarcely any black matter was found in the stomach, and as it is by no means probable, that the black matter of the intestine had been exhaled in the stomach, we can hardly attribute the loss of warmth to a hemorrhage of that

viscus. Besides, there were no black stools in the twelve hours following that in which the warmth began to leave the extremities, so that, notwithstanding the numerous facts which appear to shew a connection between the exhalation of blood on the gastro intestinal mucous membrane and the loss of warmth, can we be said to understand fully that connection in this case? Do we know to what the loss of warmth is to be referred?

As to the causes of death, it seems to me that we may find them in the existence of several lesions at the same time, as the softened state of the mucous membrane of the two intestines, the condition of the lungs, and the intestinal hemorrhage.

As to patients whose histories have been communicated to us, we do not know if there were vomitings in every case, or if on the contrary, several were exempt from them, as this symptom has not been noted in all the cases. It is the same with the spontaneousness, which has been mentioned in two instances only. But of twenty-six patients, in whose cases mention of vomiting has been made, ten, amongst whom I do not count those who had taken an emetic, vomited as early as the first day. In the others, the vomitings commenced on the second, fourth and fifth days of the disease. In sixteen cases they were of a black color; they were black the last day of life only in ten patients, and in the thirty-

six or forty-eight last hours in four; during the three last days of the disease in two. In the six last cases, the whole duration of the disease was from six to fourteen days.

In these cases then, as in those taken by ourselves, the black vomitings took place in the greater number, and another point of resemblance to be noted is, that the vomitings were repeated every day until the death, even in cases where they came on at the commencement of the disease.

SEC. II.—PATIENTS WHO RECOVERED.

All the patients whose complete histories we have taken with reference to this point, thirteen in number, vomited, one only excepted. The vomitings occurred on the first day in eight cases, and in several of these spontaneously in the middle of the night. In the others, they came on from the second to the fourth day, and in the greater part they lasted only twenty-four hours, whether they commenced the first or the following days. They were not black in any case.

The state of the digestive functions was mentioned in eighteen of the soldiers whose histories have been communicated to us, and fifteen of them vomited a greater or less number of times; five, the first day of the disease, and soon, or almost immediately after its commencement, some spontane-

ously at an earlier or later period ; others, after drinks, castor oil, or other medicines.

The vomitings were momentaneous, or continuing but a little while, took place once only, or during only one day, in four patients. In the others they came on several times, or during several successive days.

Usually yellowish or greenish, they had the consistence and color of prepared chocolate on the third day of the disease in one patient, who was convalescent the ninth day.

All of the ten patients vomited, for whose histories we are indebted to Messrs. Mery and Dias, and who have not been counted amongst the preceding, two of them spontaneously, one, the third day, after the administration of a certain quantity of castor oil, the others, after an emetic given by these gentlemen, and which seems to have been their practice with all their patients, when they were called in time, that is to say, at the commencement of the disease. But one fact which we should notice is, that those patients who vomited after having taken tartar emetic, did not vomit after the first dose, which was of about a quarter of a grain, but only after the fourth, the fifth, or the sixth ; shewing, as it seems to me, that in these cases, as undoubtedly in many others, the mucous membrane of the stomach was not affected at the commencement of the disease. This conclusion is confirmed by another fact, that

in four fifths of the cases where the patients took an emetic, the vomitings did not continue after the first day of the disease, that which would not have taken place, or at any rate in the greater number of cases, if the emetic had come in contact with an inflamed surface. The same fact seems also to prove, that an inflammation of the mucous membrane of the stomach did not take place in some patients at any period of the disease. We might come to this same conclusion in many of these cases from analogy with what has been observed in fatal cases.

The vomit resembled soot mixed with water, in one of the ten cases; was black and mixed with blood in another, on the seventh day of the disease, which continued eleven days.

Thus, the vomitings took place in patients who recovered, as well as in those who died, but they continued a shorter time, were much less often spontaneous, and much more rarely brownish or blackish, in the first than in the second. And if the reader remembers the remarks which have just been made, and those which were suggested by the condition of the epigastrium, he will conclude that the mucous membrane of the stomach was more slightly and more seldom affected in the patients who recovered, than in those who died. This fact is not, however, peculiar to the yellow fever, for in the course of other acute diseases, the secondary lesions are, at

least for the most part, more frequent and more severe in patients who die, than in those whose disease terminates favorably.

Another fact adds weight to these remarks, that the appetite returned as the fever subsided, so that the patients were soon allowed their usual quantity of food, and this too, in most cases without injury.

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## ARTICLE XI.

### THE STATE OF THE ABDOMEN.

Conformation; Diarrhœa; Pain.

#### SEC. I.—FATAL CASES.

The abdomen preserved its natural form through the whole course of the disease in all the patients whom we have examined, and this fact is of the number of those which establish well marked characteristic differences between the yellow fever and typhoid fever, where the meteorism is so common, and sometimes so marked, even at a period but little removed from the commencement of the disease.

As to the abdominal pains, of the eleven patients in whose cases we are exactly informed as to this point, five experienced them during a variable space of time, twenty-four, thirty-six, or forty-eight hours, at different periods of the disease (3, 6, 9, 15, 22).



Their seat and their cause were not always the same, nor was this latter always to be ascertained. In one case it might be attributed, and with probability, to the inflammation of the mucous membrane of the intestine, of which we found traces at the autopsy, and not to purgatives, which were mild and not given till the third day of the disease, nor till after the commencement of the pains. The causes were doubtless the same, or at least in part, in another case, where purgatives and drinks had some effect (3), but it is not possible to know exactly what to think, nor even to fix the seat of the pain in a third and fourth patients, in whom the spleen, the mucous membrane of the stomach, and that portion of the great intestine the situation of which corresponds to the point to which the pain was referred, to the left hypochondrium, were natural. In another case, where the patient had complained of pains in the right hypochondrium, the mucous membrane of the colon was only moderately softened, neither red nor thick, and the liver presented only the specific alteration observed in all the cases, which gave rise to no kind of pain (6).

We should not however be astonished, the softening of the mucous membrane of the intestine being so frequent, that the abdomen was not oftener painful, since this softening, when not the consequence of inflammation, as was most usually the case, is not

accompanied by pain in the course of other acute diseases. At the same time we may well be surprised that men, who took so often such violent purgatives, had not frequent colics, and that in two cases only was there any tenesmus (1, 21). There was no spontaneous diarrhœa in any case; and if the repeated administration of purgatives in some cases does not allow us to know what would have happened had nature been left to itself, we may at least presume that the stools would not have been numerous, since they ceased to be so as soon as the purgatives were discontinued. It seems to me that this is a tolerable clear proof of the slight tendency of the intestinal mucous membrane to inflammation in yellow fever patients.

In patients whose histories we have not taken ourselves, mention has been made of the state of the abdomen six times, once to remark that the pain of which it had been the seat, had diminished after the administration of an opiate; thrice to say that the abdomen was insensible to pressure; in a fifth case to note a slight degree of tumefaction, and a contrary state in a sixth case. These facts agree with those which we have collected ourselves, and for that reason they are of value, though their number is small.

The color of the stools was noted in twenty-five cases. In twenty, they were more or less brown

or black at some period of the disease ; in seven cases, the last day only ; in eight, during the last thirty-six or forty-eight hours ; in the other three, four, six and eleven days before the fatal termination ; and in these cases the disease proved fatal from the fifth to the fourteenth day. It is also worthy of remark, that the heat was not increased the day when the dejections became black, except in one of twenty cases.

We should remark also, that if the black vomit preceded the black stools in a certain number of patients, the contrary was more frequent. This confirms the conclusions which I thought myself warranted in drawing from the condition of the organs, viz. that in the course of the yellow fever of Gibraltar, of 1828, the black matter did not come from one source only, and that if in most cases it was exhaled in the stomach, it came from the intestine in other cases. Thus is it that the attentive consideration of lesions and symptoms conducts to the same results.

#### SEC. II. — PATIENTS WHO RECOVERED.

The form of the abdomen was natural in patients whose histories we have taken, and eight of fifteen did not experience any abdominal pain. Five of seven others had colics at different periods of the disease, during about twenty-four hours, either along

the route of the transverse colon, or in the hypogastrium, or in other parts of the abdomen, and in some cases, the colics were the consequences of purgatives, which were very often given.

The stools were numerous in some patients, but during one, two, or three days only, and always after more or less drastic and repeated purgatives. In no case was there superpurgation. This is a new index of the sound state of the intestinal mucous membrane at the moment when purgatives were administered, and of the low degree of sensibility of this membrane to excitants.

The fœcal matter was brown or black, in a third part of the cases, or in five patients; and this state of the stools which came on from the second to the fourth day of the disease, continued from two to five days. It is principally in patients whose dejections were of this character, and at the moment when they took it on, that abdominal pains were experienced. For this reason, we are inclined to believe, that the intestinal hemorrhage had something to do with them. In no case was any blood mixed with the fœcal matter.

These facts confirm what has already been said of the share which the intestinal mucous membrane has in the production of the black matter found on its surface, since the black or brownish red vomitings did not take place in any of the fifteen subjects,

whose histories we are analyzing, so that we can hardly suppose the stomach to have furnished the black or brown matter of their stools.

Abdominal pains have been mentioned in only one of the patients whose histories have been communicated to us, and in whom the dejections at the same time were black. The form of the abdomen was natural in two cases where it was examined. In fourteen cases, the stools were brownish during a number of days, varying from two to five. Six of these cases were amongst ten communicated to us by Messrs. Mery and Dias, so that one might believe that the hemorrhage, to which the color of the stools was due, took place oftener in private patients of the city, to whom but little mercury was given, than in soldiers to whom it was administered in large doses. This difference, however, is rather apparent than real, the dejections having been examined more attentively and thoroughly in private than in hospital patients, and the first class of cases having been selected for their severity.

One patient, whose illness lasted five days, had blackish stools the first day, and black stools the third. This patient had no other hemorrhage.

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## ARTICLE XII.

## CONDITION OF THE URINE.

## SEC. I. — FATAL CASES.

The urine was not remarkable as to its color, it was not suppressed in any of the patients whose histories we have taken. This suppression took place during two successive days in one patient whom we examined, and whose history was taken by Mr. Frazer, by whom it was kindly communicated to us. This observation comes in here so naturally, that we feel it ought not to be withheld from the reader.

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EIGHTEENTH OBSERVATION.

ALPHONSO MANUEL, a laborer, æt. 23, had, as Mr. Fraser told us, all the symptoms of the epidemic fever, when he was admitted into the Civil Hospital the 3d of December. The attack had been violent. Four ounces of olive oil were given him in successive doses, a short time after his arrival, and these were followed by three or four dejections

The morning of the 10th, there was febrile reac-



tion ; the eyes brilliant, much injected, yellow, their motions and those of the eyelids very languid ; the frontal headache diminished ; the tongue moist, its central part of a milk color, its edges natural ; pain on pressure in the epigastric region ; the skin universally yellowish.

Diaphoretic mixture ; soup.

The 11th, no amelioration ; vomiting ; suppression of urine ; the catheter was introduced without success.

R Aqua. font.  $\text{℥}$  ij. ; Aeth. nit., vin. colch. aa.  $\text{℥}$  j.

At noon, an ounce of the chloride of sodium was given to the patient ; the suppression of urine continued, and none was obtained by the introduction of the catheter.

The patient was very uncomfortable during the night. The next morning, the 12th, towards nine o'clock, this condition continued, and was accompanied by a convulsive movement of the lips. Death took place at six o'clock in the evening.

*Autopsy nineteen hours after death.*

EXTERIOR. — Body well formed ; cadaverous rigidity.

HEAD. — *Dura mater* yellowish ; *pia mater* slightly injected ; no sub-arachnoid infiltration ; two small spoons full of clear yellowish serum in the *lateral ven-*

*trices*. *Cineritious* and *medullary* substances of the *brain* and *cerebellum* natural.

The *spine* was not examined.

NECK. — The mucous membrane covering the *glottis*, the *palate*, and *pharynx* were of a very marked greenish grey, in other respects natural; that of the *trachea* was of a vinous red, and of a natural consistence.

CHEST. — The *heart* flaccid, of a good color; its tissue of a natural coherence. Its right cavities contained a small fibrinous clot; their internal membrane natural. The left auricle and ventricle contained a good deal of clotted blood; the ventricle, a small fibrinous, yellow clot. Their lining membrane was of a cherry red, the mitral valves of a deep red; the lining membrane of the *aorta* and *great vessels* of a bright red, in bands or patches, without thickening. The *lungs* were free, except some cellular adhesions of the left lung. In the central and posterior parts were a number of brownish red spots, containing a little liquid blood, which could be squeezed out of them by a gentle pressure. In the intervals, the pulmonary parenchyma had a red tint much less deep, and as great a cohesion. The incisions into it gave out a small quantity of blood.

ABDOMEN. — There exhaled a very fœtid odor at the opening of the abdomen; the *œsophagus* of a

yellowish white color, its epidermis entire. The *stomach* of twice its usual size, distended by gas of an extreme foetidity, contained eight ounces of a yellowish liquid, which appeared to be nothing else than a part of the drinks taken by the patient. Its mucous membrane was slightly greyish, except near the pylorus, where its villousities were injected in the surface of an inch, and except five or six ulcerations, of about a line in diameter, which were superficial, with depressed edges, and found on the posterior face. This membrane was not remarkable in other respects. Its consistence, thickness and velvety aspect were natural. The *small intestine* was distended by gas as foetid as that of the stomach. It contained a yellowish liquid mixed with mucus. The mucous membrane was injected in the duodenum and commencement of the jejunum for the length of four feet; after that, it was of a natural color. Its thickness and consistence were natural through the whole extent. It gave strips of from one to three lines in the duodenum and jejunum, of from four to six in the first half of the ileum, whilst in the second half, its consistence was that of mucus. *Peyer's glands* were natural; those of *Brunner* visible in the length of one foot near the *cæcum*. The sub-mucous cellular tissue was slightly injected in some points of the first half of the *jejunum*. It was still more so in the six last feet of the *ileum*, where the injec-

tion appeared to have transuded at intervals, and to have colored red the corresponding mucus. The mucous membrane of the *large intestine* was of a pearl grey color, except in the *rectum* where it had a rose tin. We obtained strips of from eight to ten lines in the *cæcum*, of from four to five in the *rectum*, of from two to three in the intermediate space. Its thickness was natural; the *mesenteric glands* were not remarkable; the *liver* of its usual size, its convex surface of a rose tint, its concave surface of an olive color. This color existed through a thickness of from six to eight lines. Beyond, and in all parts of the organ, in the great as in the middle, lobe, it was of the color of fresh butter, and on it a multitude of small points of a pale rose color were conspicuous. It was deprived of blood and less easily torn than usual. The *biliary ducts* were free, the *gall-bladder* contained about an ounce of a slightly viscous and moderately colored bile. The *spleen* was smaller by one third than usual, and somewhat softened. The *kidneys* of a proper size; they were more easily torn than usual, and their cortical substance spotted with red points. Nothing else was remarkable.

Although the history of this patient is incomplete, it is very interesting on account of the suppression of urine, and perhaps more so anatomically. There

was no black matter in the stomach or intestines ; the skin was universally yellow, and in both the lungs we found the lesions which are so frequently met with in the victims of yellow fever. The liver was of that remarkable color which we have found in all the fatal cases of the Gibraltar epidemic of 1828. Then too, amongst the few lesions, we did not find the anatomical characters of any other disease, so that we must admit the disease of which this patient died to have been the yellow fever. We may add, that it is not possible to explain the suppression of urine by the anatomical condition of the kidneys, which were not remarkable.

SEC. II.—PATIENTS WHO RECOVERED.

The urine was not suppressed in any of the cases which we have taken ourselves. In these same patients, the color of it was not remarkable.

Amongst those not observed by ourselves, was a soldier who had a suppression of urine during twenty-four hours, on the fourth day of his disease. The same symptom was presented on the seventh day of the disease, in a case communicated to us by M. Dias. No mention has been made of this symptom in the histories of the other patients, so that we may very truly say, that the suppression of urine was a rare symptom in the course of the yellow fever of Gibraltar of 1828, and that it hardly can

be considered one of the symptoms of the disease, but rather an accident. This consideration acquires more weight from the fact, that the suppression of urine is observed at Paris in some severe and rare cases. One of my professional brethren, Mr. Amiel, who had a great deal of confidence in calomel, thought that the suppression of urine was more frequent in the inhabitants of the city than in the soldiers, and this difference he attributed to that of the treatment, inasmuch as the calomel was rarely used in the city, and frequently amongst the soldiers. This opinion is not based on certain data, and therefore we must not set it down as true.

One inference may be drawn with safety from this inconsiderable number of facts, that the suppression of the urine in the epidemic of Gibraltar was not a symptom of so fatal a character as it was believed to be, nor did it announce, at all positively, the death of the patient. In two cases, the urine was scanty during two successive days, counting from the commencement of the disease. It deposited a blackish sediment on the fourth day, in one patient observed by Mr. Amiel, who had the black vomit at the same period, and whose convalescence commenced two days later.



## ARTICLE XIII.

## STATE OF THE TONGUE.

## SEC. I. — FATAL CASES.

Except in two cases, the tongue was always moist in the patients whose histories we have taken, the day before, and the day but one before death. It was whitish, not decidedly red, in four cases; one only of these patients took mercury during the whole course of the disease (2, 3, 5, 14). It was constantly of a more or less bright red through its whole extent in three patients, to one of whom only had any mercurial preparation been administered (11, 14, 15); this man took calomel. In the other cases treated mostly in the same way, the central part of the tongue was more or less white and villous, its edges red.

In patients not observed by ourselves, the tongue was nearly in the same condition as in the others. It was dry, encrusted, black, the last day of life, in nine of thirty-five patients, and almost solely in those who took no calomel. I will add, that in one case it trembled from the commencement, and in another, on the two last days of the disease.

## SEC. II. — PATIENTS WHO RECOVERED.

The tongue was always moist in the individuals observed by us, if we except two, in whom it was

dry the second day of the disease. In two others it was almost always natural up to the convalescence; constantly whitish and without redness, in four. Its centre was whitish and more or less red in the others. The state of the digestive functions was variable. The tongue was the seat of rather a grave hemorrhage on the fourth day of the disease, in one patient, who was convalescent the ninth day, after having taken calomel.

The condition of this organ was not sensibly different in twenty-six soldiers, whose histories we did not take ourselves, and in four of them, it was the seat of rather a considerable hemorrhage from the fifth to the ninth day of the disease. All these patients took calomel, and all, with one exception had hemorrhage from the gums.

Patients treated by Messrs. Mery and Dias, had no hemorrhage from the tongue; they were ten in number. Two of them lost blood from the gums. Except this difference, which is to be attributed in part to the difference of treatment, the state of the tongue was nearly the same in these patients, and in those observed by ourselves.

It results from the facts which I have presented in this article, that the tongue of the yellow fever patients of Gibraltar of 1828, had no character peculiar to that disease, though it was more generally white and villous than in other disorders. The

hemorrhage, of which it was the seat in some cases, undoubtedly was principally caused by the mercurial treatment.

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## ARTICLE XIV.

### RESPIRATION.

#### SEC. I. — FATAL CASES.

The state of the respiration was not remarkable during the first half of the disease in patients whose histories were taken by ourselves. After that period, in ten cases where it was carefully observed, the respiration was more or less deep during the last, or the two last days of life. In six patients it was convulsive, or accompanied by hiccough, the last day of life.

We cannot explain this last symptom by the anatomical condition of the lungs, or by that of the other organs, certainly not by that of the stomach and intestines, the condition of these organs being nearly the same in those individuals who had hiccough, and those who had not.

Eleven of seventeen patients not observed by ourselves, and of whose respiratory phenomena an account was given, had hiccough, and all, with one exception, during the twenty-four last hours of life.

In the case which is an exception, the hiccough lasted three days, increasing until the fatal termination, without being accompanied by black vomit.

SEC. II.—PATIENTS WHO RECOVERED.

The respiration was suspicious for a short time in some of the patients observed by ourselves, but in no case was there hiccough. Two patients treated by Messrs. Mery and Dias, sobbed a little during twenty-four hours, on the fifth and sixth days of a disease, from which they were convalescent the eighth and ninth. In no case was there cough. One patient only experienced some pain behind the sternum.

The hiccough, so frequent in those who died, was not observed by us or by our brethren in those who recovered, at least in those patients of whose histories we have had knowledge. The hiccough, then, was one of the gravest of all the symptoms which came on in the course of the yellow fever of Gibraltar of 1828, and its presence in persons suffering under that disease, should, for that reason, have been regarded as an almost certain sign of death.

The absence of cough in these patients deserves to be noted, as cough is often observed in individuals suffering under the acute diseases of Paris. It is true, that these diseases are longer, and that they are

accompanied by more considerable febrile symptoms than those observed in the yellow fever.

The absence of hemoptysis, in subjects whom we must believe to have been predisposed to hemorrhages of all kinds, and in whose lungs we have so often found that deposition which has been considered by the illustrious Laennec, the cause and the anatomical character of severe hemoptysis is still more remarkable. And we may remark, in passing, that such a fact is sufficient to disgust us with conclusions from analogy, and it may serve as a warning to light minds too eager to draw conclusions.

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## ARTICLE XV.

### STATE OF THE SKIN.

#### SEC. I.—FATAL CASES.

The color of the integuments was carefully described in eleven patients whose histories we have taken, and in all, with one exception, the skin was more or less yellow during the thirty-six or forty-eight last hours of life, and on the fourth or fifth day of the disease, or even earlier, as we shall see in the facts which I am about to lay before the reader. In two cases, this color was principally on the thorax, and it was preceded by a more or less

vivid injection in four patients, two of whom had the integuments of the chest redder than those of other parts.

Of seventeen individuals not observed by ourselves, and in whose histories the state of the skin has been mentioned, fourteen were more or less yellow, ten the last day of life only, the others from two to six days before the fatal termination, and as in other individuals, the yellowness was often more marked on the chest than any where else.

The skin was the seat of an exhalation of blood in two cases. In one case the hemorrhage took place around a blister, in the other case from leech bites which had been cicatrized. The loss of blood in this case was considerable, and these two patients treated by Messrs. Mery and Dias had taken no mercurial preparation.

#### SEC. II.—PATIENTS WHO RECOVERED.

In four of thirteen patients observed by us, the skin was more or less yellow ; in one as early as the third day of the disease, in the others a little later. The integuments were found to be injected in the same number of individuals, those of the chest more particularly, from the moment that they were submitted to our observation.

Eleven, or the fourth part of the patients whose histories were communicated to us, had a more or less



yellow skin ; one of them as early as the third day of the disease, two on the fourth, the others from the sixth to the eighth only.

The yellowness, then, was not a constant symptom of the yellow fever of Gibraltar of 1828 even in fatal cases. It was not observed frequently in patients who recovered; according to our tables, in a little less than a third part of these patients. And this proportion is in reality too great, since the facts which we analyse have been selected, as I have already observed, by our professional brethren, as the most interesting on account of their severity, or on account of other important circumstances. For this reason, then, the yellowness cannot be considered essential to the disease we are studying. The early appearance of it is not to be regarded as so fatal a symptom, as it has been thought to be by some of the Gibraltar Physicians.

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#### NINETEENTH OBSERVATION.

MOSSEY, a soldier of the 94th regiment, æt. 29, two years at Gibraltar, became ill the 6th of December, and was admitted into the Wind-mill Hospital the same day. He had been on guard before the hospital without entering it. However, ten days before he

had cleaned some rooms in it, and two days later, he had been on guard at the southern barracks. On Thursday of the previous week, he had remained three minutes in the city, and a soldier some days convalescent from the yellow fever had returned to his tent a few days before, where, however, no other person had been ill.

He had committed no excess the day of, nor the day before, that of his illness, which commenced at five o'clock in the afternoon, by a violent headache, weakness of the legs; followed an hour later by general convulsive pains.

The patient was placed in bed, where two enemata were administered. The first composed of four quarts of water and of from two to three ounces of olive oil, came away almost immediately in the same state in which it had been thrown up. The second composed of four quarts and a half of water, was retained five minutes, and there came away with it a considerable quantity of fœcal matter. Ten grains of calomel and two ounces of castor oil, were then administered, and during the night the patient vomited several times and had several stools.

The morning of the 7th, headache; the countenance slightly red; the eyes moist and injected; the pupils contracted; pains in the loins and in the limbs; respiration free and natural; pulse regular, slightly vibrating, one hundred; skin somewhat hot

and dry ; base of tongue whitish, the other parts of it natural ; the abdomen supple, indolent ; no nausea ; no colics ; the mind clear ; the patient thought himself strong.

Twenty-five leeches to the temples ; diaphoretic mixture composed of spirits of Mindererus, three ounces ; camphor, seven grains ; two enemata containing olive oil ; tea and gruel for drink.

The patient was comfortable through the day. Towards evening an enema was given, which was followed during the night by from twelve to fifteen stools of rather a deep yellow color. He had no nausea and did not vomit.

The 8th, the mind and senses in the same condition as on the preceding day ; no headache ; the lumbar pains diminished ; considerable weariness and weakness ; the sclerotics yellow ; the heat increased ; the skin dry, not yellow ; the pulse large and regular, eighty ; the respiration natural, occasionally a slight cough ; the point of the tongue red, its base coated ; the gums red and swollen, covered in several points with membranous pellicles ; no nausea, no vomitings ; the abdomen supple and indolent ; the stools numerous, the urine easy.

Two grains of calomel with two of James' powder every three hours ; common enema.

In the course of that day there was some nausea and a vomiting of yellowish bile.

The 9th, an effervescing draught was prescribed to be taken every two hours, twenty-five drops of laudanum to be added if the vomitings did not cease.

The vomitings ceased only after the administration of the laudanum, and they returned during the night. There was some subsultus of the tendons in the evening, and three stools of a deep green color in the night, through which the patient was comfortable.

The 10th, the countenance denoted suffering and was less red than the preceding day; the eyes injected, slightly yellow; yellow tint on the chest and back; slight delirium; headache; acute dorsal pains; moderate moist heat; pulse moderately strong; respiration natural; the point of tongue red, its base yellow; the gums swollen and very red; salivation inconsiderable; frequent vomitings; urine easy. An egg was given to the patient which he took with pleasure. A camphor mixture was prescribed, and afterward an ounce of brandy in four ounces of water.

The black vomit came on at noon, and he died the next morning at three o'clock.

*Autopsy ten hours after death.*

EXTERIOR. — Athletic form; considerable rigidity; universal but slight yellow tint; lividity not very deep. A black liquid flowed from the mouth.

HEAD. — The *dura mater* and *pia mater* yellowish; the *cortical* substance of the *brain* of a lilac tint; that of the *cerebellum* of rather a deeper color; the *medullary* substance slightly injected; a spoonful of liquid serum in the *lateral ventricles*; no sub-arachnoid infiltration.

SPINE. — *Spinal marrow* natural.

NECK. — The *pharynx* not remarkable; the *epiglottis*, and the *larynx* were of a vinous red.

CHEST. — The *pericardium* contained a little yellowish serum, the *heart* contained some fibrinous clots, and was perfectly natural. The *aorta* and *vena cava* were filled with black blood; the *lungs* did not collapse, and the left lung was not remarkable; the right was heavy, and on cutting into it, a considerable quantity of frothy blood flowed out from it through its whole extent and thickness. The surface of these incisions was spotted, that is to say, on a bright red ground there were conspicuous a multitude of deep crimson spots of a variable size and form, which were owing to the effusion of liquid blood that could be squeezed out. The cohesion of the lungs was diminished in proportion as these spots were more thickly clustered.

ABDOMEN. — The *æsophagus* was not remarkable; the *stomach* was distended with gas, and contained a pound of thin black fluid like ink; its mucous membrane was of a bright red in the diaphragmatic

half, of a yellowish grey color elsewhere ; it was mamelonated through its whole extent, and of almost double its usual thickness, except in the great cul-de-sac, and along the small curvature. Its consistence was almost natural, it gave strips of from five to six lines in length along the small curvature, of from three to four in three quarters of the great curvature, of from six to eight on its posterior surface and near the pylorus ; the *duodenum* and *jejunum* contained a great deal of black matter similar to that in the stomach, only a little thicker ; in the *ileum* we found a great deal of mucus of the color of putty, and of the consistence of paste ; the mucous membrane of the *small intestine* was of a greyish color through its whole extent, and its consistence and thickness were natural throughout ; the *large intestine* also was perfectly natural ; *Peyer's* and the *mesenteric glands* not remarkable ; the *liver* was of a proper size, its consistence and cohesion were more marked than usual ; through its whole length and thickness its color was that of table mustard ; the *gall-bladder* contained about a spoonful of bile of an olive green color ; the other viscera were not remarkable.

This observation is interesting in several particulars, and especially so, for the symptom we have been considering. The yellowness commenced



before the close of the second day of the disease, about forty hours after its commencement, so that probably even at that time the liver was more or less altered, and therefore the commencement of its lesion must be considered to have been at about the same time with the first symptoms. This proposition will, if possible, be more evident, when we call to mind that in some acute diseases of the liver, in hepatitis for example, the yellowness appears at the same time with the first symptoms, and that the state of the liver in yellow fever patients appears to have been the opposite of that of inflammation, so that it is natural to believe, that the symptoms depending on it, would have a less rapid progress.

Amongst others of Mossey's symptoms, we should remark the vomitings which took place the first day, soon after the commencement of the disease, and which were undoubtedly the first effect of the commencing inflammation of the mucous membrane of the stomach. As to the delirium, it was slight, and came on the last day of life. We cannot consider it the effect of a gastritis, not so much because it came on at a late period, as for the reasons pointed out above, and one of the most conclusive of which is the extreme infrequency of delirium in the most intense gastritis, that, for example, which is the result of corrosive poison.

If we except the vomitings, the disease had a re-

markable appearance of mildness, so that had we not known what prognosis is to be drawn from the black vomit, we should have hoped for the recovery of the patient, when he was already on the border of the grave.

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## ARTICLE XVI.

## HEMORRHAGE.

Although the facts relative to hemorrhage, must be familiar to the mind of the reader, I believe it useful to collect them together in a separate article, as in this way, we shall get a more exact idea of them.

## SEC. I.—FATAL CASES.

In four sevenths of the patients whom we dissected, the brown or black vomit, or stools of the same color, had occurred in the last twenty-four or thirty-six hours of life. In other patients who had not vomited this matter, we found a greater or less quantity of black matter in their stomachs, at the autopsy. One of these had a hemorrhage in the thickness of the muscles, many others in the pulmonary parenchyma. There was no hemorrhage in the other organs.

Of thirty-five patients not dissected by ourselves,

one had a hemorrhage of the tongue, four or five lost blood from other parts of the mouth, and generally they took more mercury than those whose histories we have taken. In sixteen, or nearly half the cases, black matter was vomited; in about the same number of cases, the stools were black in the last twenty-four or thirty-six hours of life, and this gastro intestinal evacuation was nearly the same in patients who took calomel, and in those who did not take any. This was not true of the epistaxis, which took place in two cases. One of these patients, who lost blood from the mouth, lost also some blood from the wound of a blister. Another, who had not taken mercury, had rather an abundant hemorrhage from leech bites that had been cicatrized. These patients did not lose blood from the other organs, unless there were effusions in the pulmonary parenchyma. Nothing of this sort, however, was noted at the autopsy.

The principal, and the greater number of hemorrhages, were from the gastro intestinal mucous membrane. There were none, at least in subjects with whose histories we became acquainted, either from the ears, or from the eyes, or from the mucous membrane of the air passages, or from that of the genito urinary organs. If, then, the exhalation of blood on the surface of the gastro intestinal mucous membrane was incomparably more frequent

in the course of the yellow fever, than in that of any other acute disease equally fatal, those from the surface of another mucous membrane, the pituitary, were by no means so.

SEC. II. — PATIENTS WHO RECOVERED.

One of the nineteen patients whose histories we have taken, had an abundant hemorrhage from the tongue and from the inside of the gums, on the fourth day of the disease. This man had taken calomel; five others had black, bloody, or brownish stools, and one, a hemorrhage from a leech bite on the eleventh and twelfth days of the disease. No other lost blood from any other surface or organ.

Of thirty-three patients whose histories have been communicated to us, four had a hemorrhage from the tongue. All these had taken mercury, and no patient treated by Messrs. Mery and Dias had a hemorrhage from that organ. Seven of twenty-three soldiers, who almost all took calomel, lost blood from the mouth several times. The same thing was observed in three patients treated without mercury by Messrs. Mery and Dias. One soldier treated by Mr. Amiel, and three of the patients of Messrs. Mery and Dias, vomited a brown or black matter, like soot and water. In fourteen cases, the stools were blackish or black; four of thirty-five, three of these being soldiers, had epistaxis. A pa-

tient of Mr. Dias, had a hemorrhage from leech bites, which had been cicatrized, and were reopened.

In the patients who recovered, as in those who died, and with whose histories we have been made acquainted, the hemorrhages were limited to a small number of organs. There were none from the eyes, or from the mouth, or from the ears, or from the genito-urinary mucous membrane. They were much rarer in the anterior of the digestive canal, in cases of recovery than in fatal cases.

In many patients, there were no hemorrhages, and they were still less frequent in another class of patients, whose disease was much lighter than that of those whose histories were taken by, or communicated to us. We might then, well ask, how authors could have thought of classing yellow fever amongst hemorrhages; did we not know that the clearest facts, those in the interpretation of which there is the least chance for error, may be obscured by subtleties, and by a rage for what is called reasoning.

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## CHAPTER II.

## MORTALITY.

It results from an examination of the tables prepared from the documents collected by the commission, that amongst the six hundred individuals, short histories of whom have been taken, the mortality of the epidemic of Gibraltar was in the proportion of one to six and a half. According to the tables prepared from the bulletins of the public authorities, published daily in the Gibraltar Gazette, giving an account of all the patients of the city and of the hospitals, the mortality was much more considerable, eleven hundred and eighty-three out of five thousand three hundred and eighty-three, or about as one to four and a half.

So considerable a difference, resulting from an examination of documents, which at first sight would appear equally worthy of confidence, would seem to shew, that in the most simple, as well as in the most complicated matters, the exact determination of proportions is not possible in pathology, or only so where the number of the facts is small. But for this conclusion to be just, the documents collected by the authorities, should have been as exact in



reality, as they are in appearance ; no case of yellow fever should have escaped them, the slightest should have been noticed, as well as the most severe, and it is precisely here that they fail, as we have more than once been able to satisfy ourselves in the course of our investigations. The authorities appeared to know very well, and in fact they did know the number of the dead, all of whom passed out by the land gate, and were counted. But there were very many who had the fever, and who never told of it, fearing they might be transported to the hospital or to the lazaretto. Thus, the authorities did not know the whole number of those who were attacked by the disease, so that the tables formed from their bulletins, come from incomplete documents, and the per-centage of mortality obtained from them is much too great. The documents obtained by the commission, are much more to be depended on, for the same motive to conceal the truth did not exist after, as during the epidemic, so that we must receive for the truth, the proportion of the commission, viz. one in six and a half.

This mortality was not the same in the two sexes, nor at all ages of life. This difference, generally believed in by the people of Gibraltar, is shewn clearly from the documents which have been collected by the commission. From these documents we find, that of two hundred and fifty children, short

histories of whom were taken, fifteen only, that is, a seventh part, died, whilst the mortality among the men was one in four and a half, and among the women, one in five and a half. This difference in favor of childhood is very great, and is owing in part to that of the constitution and the strength, for there was a difference also in favor of the women, whose constitutions and strength more nearly resemble those of children.

Not only was the disease less severe in women than in men, much less in childhood than in adult age; but the same symptoms have not the same value for the prognosis, at all periods of life. Thus the black vomit, which in men was the almost certain harbinger of death, took place in a great many children who recovered.

But the reader must not believe the proportion of mortality at the different ages of life to be the same in all the epidemics of yellow fever, nor that which I have given. It is not always so, even at Gibraltar, so say the medical men who have observed several epidemics of yellow fever in that city, and who assured us that this disease was by no means always as mild in children.

According to one of our professional brethren, Mr. Frazer, surgeon of the Civil Hospital of Gibraltar at the time of the last epidemic, pregnancy must have been at that time, a condition unfavora-

ble to recovery. But this opinion, though probably correct, is not founded, as I believe, on a number of facts carefully analysed, so that we cannot receive it as true. This, however, is the place for the history of a pregnant woman of five months, who died at the Civil Hospital, and the history of whose symptoms, we owe to the kindness of the above-named gentleman.

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#### TWENTIETH OBSERVATION.

ELIZABETH PRENCY, æt. 26, the wife of a soldier of the forty-third regiment, was sent to the Civil Hospital on the 18th of November, by an assistant surgeon, who believed her to have the prevailing disease. Being in the fifth or sixth month of pregnancy, there was a slight swelling of the breasts, which secreted a considerable quantity of milk. The tongue was clear; she had some appetite. At her arrival, an egg and some wine were prescribed, and the next morning she returned to the camp, with a fresh color, not complaining of pain anywhere. She continued well during the two following days, was seized with the fever the 23d, and re-conducted to the hospital the evening of the 25th. The administration of a dose of castor oil, had been followed by some dejections.

Shortly after her arrival at the hospital, anxiety, eyes downcast, inanimated, at once yellowish and reddish ; headache frontal, intense ; pains running through the back and thighs ; tongue white and trembling ; frequent vomitings. — Twenty leeches ; enema. During the night, vomitings ; frequent dejections after enema ; sleeplessness.

The morning of the 26th prostration was the same as on the preceding day ; acute pains in the left hypochondrium ; tongue whitish ; suppression of urine since the preceding day.

Effervescent draughts, injection into the vagina.

In the evening, the prostration greater ; vomitings not black at intervals. The extremities cold ; the patient evacuated a small quantity of urine.

Ginger-beer, mixed with water.

The 27th, the countenance dull ; the skin of a lemon color ; the pulse accelerated ; the whole body sensible to the least pressure ; Leeches to the epigastrium ; emollient enemata. Towards noon, at the same time with some affection of the mind, the patient experienced a slight amendment. In the evening she was still better after the application of an emollient poultice to the abdomen ; the countenance better ; the pulse natural.

Poultice to the abdomen.

Sleep at night ; colic ; vomiting.

The 28th, prostration ; hemorrhage from leech bites. Ginger-beer and milk for drinks.

The vomitings continued ; sometimes blackish ; and the patient had several dejections in the course of the day.

Acetate of lead grs. iij. in an anodyne draught, half of it immediately, half of it two hours later.

The patient vomited the first dose, took an anodyne enema in the evening, which was followed by sleep, and died the next day at noon.

*\* Autopsy twenty-two hours after death.*

CHEST. — The *heart* flaccid and pale, containing fibrinous clots. Its cohesion as usual. The *aorta* of a rose color at its origin, natural in other parts. The *lungs* collapsed anteriorly. Below the pleura and posteriorly, a great many rounded spots of a deep red color, nearly black, without any increase of the density of the corresponding tissue.

ABDOMEN. — The *stomach* moderately distended, containing about a pound of a soot colored liquid, in which were suspended a great many little clots like burnt coffee. Its mucous membrane was of a bright rose color in the great cul-de-sac, and perhaps this color was more marked near the pylorus. In the intermediate space, and near the great curvature it

*\* The body of this woman was buried soon after death. Mr. Frazer took out the viscera of the abdomen and thorax, and preserved them in a wet cloth. The brain was not examined.*

was whitish, except along its folds, where it was mamelonated and of a moderate consistence; its strips being of from three to five lines; whilst in other parts they were only of from one to three lines. The *duodenum* contained an olive pultaceous matter; the villousities of its mucous membrane were injected. In the *jejunum* a similar matter was found, and in the four last feet of the *ileum* a matter fully as thick and of a wine-lees color. Near the *duodenum*, for the length of a foot, the mucous membrane was dotted with red, after which it presented its usual aspect, except near the *cæcum*, where, in the four last feet already mentioned, it was of a deep red color, penetrating the whole thickness of the intestine, and diminishing progressively towards the peritoneum, which was colored but slightly. The consistence in this last part was that of mucus, and it increased in approaching the jejunum, where strips of from three to four lines were obtained.—The large intestine contained a pint of matter similar to that found in the last feet of the ileum, but of a deeper color. Its mucous membrane was of the same color, and we obtained strips of it of from one to two inches in length through its whole extent.—The *mesenteric glands* and the *elliptic patches of Peyer* were not remarkable. The *liver* was of a good size, and of a clear uniform yellow color through the whole thickness. There were however some red



points in the great lobe, and the yellow color seemed to be the product of lemon yellow and of straw yellow points. The cohesion of the hepatic tissue was not sensibly altered. The *gall bladder*, five inches long, and three in width, was distended by a liquid of the color and consistence of urine, in which were floating some white mucous flocculi. Its internal membrane, dotted with red in several points, had no longer its natural appearance. The *biliary ducts* were free, and their mucous membrane perfectly natural. The *spleen* was of a wine-lees color, and more easily torn than usual. The cortical substance of the *kidneys*, of a lemon yellow color. The *bladder* small, in other respects natural. The *uterus* contained a five or six month foetus, about whose neck were ecchymoses, and whose skin was of a universal wine-lees color. The amniotic fluid was of the color of healthy urine.

We do not know what were this patient's symptoms in the two first days of her disease ; but on the third, the prostration was considerable ; the eyes of a slight yellow tint, and the tongue tremulous ; frequent vomitings came on ; the headache was intense ; the prostration continued, now more, and now less. In the following days, the vomitings returned ; they were more or less brownish in the last twenty-four hours. The abdomen was painful, especially so in

the left hypochondriac region, during the last three days. The extremities were cold at the end of the fourth day, or at the commencement of the fifth. At the same time the whole body was sore; the mind but temporarily affected; the leech bites became the seat of a slight hemorrhage the day before that on which the disease terminated fatally. At the autopsy, we found a sooty black fluid in the stomach, a wine-lees colored liquid in the ileum and large intestine; the mucous membrane of the stomach inflamed in a part of its extent; the liver of a nearly uniform yellow color, without any alteration of its natural consistence. In one word, as most of the symptoms of the victims of yellow fever were present during the life of this patient, so, at the autopsy those lesions were observed which form the anatomical character of the above-named disease.

The symptoms had a mild appearance, and the same thing was observed in other cases. Since, then, the symptoms and the lesions were in no essential point different from those of other cases, there is nothing peculiar to this case, nothing to be attributed to the influence of pregnancy, an influence which undoubtedly exists, but which we cannot appreciate, nor clearly establish, but by the analysis of many facts.

The sensibility of the whole body to the least

pressure, is found in some cases in other acute diseases, so that it cannot be considered peculiar to this disorder.

We should remark also, that though the leech bites were the seat of a hemorrhage, the hemorrhage of the alimentary canal was not considerable, so that in similar cases we cannot strictly conclude, one of these hemorrhages being abundant, that the other is also.

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### CHAPTER III.

WERE THE CHARACTER AND SEVERITY OF THE YELLOW FEVER OF GIBRALTAR OF EIGHTEEN HUNDRED AND TWENTY-EIGHT THE SAME AT THE COMMENCEMENT, AND AT THE TERMINATION OF THE EPIDEMIC ?

It is a generally received opinion, that epidemic diseases change their character at different periods of their duration, and with a view of ascertaining the truth as to this point in the epidemic of Gibraltar of 1828, I have made an analysis of the symptoms manifested by the numerous patients, whose histories have been communicated to us by our professional brethren. We have already seen how great

is the resemblance between their observations and our own, although these last were all taken between the 24th of November, and the 24th of December ; and their's, with only four exceptions, before that period, in the months of September and October. We have seen also, that the same lesions were found in subjects examined by us, towards the close of the month of November, as at the end of the month of December. It would seem natural to conclude from this, that the yellow fever of Gibraltar of 1828 preserved its characters, symptomatical, as well as anatomical, in the last month of its prevalence. And if so, must not the disease have been the same during the preceding months ? For symptoms could hardly have been the same in September, October, November and December, and the lesions not identical. And this conclusion is really the expression of facts ; for of thirty-five patients who have died, and whose histories have been communicated to us, four died in September, and in all, there was a greater or less quantity of black matter in one or more parts of the intestinal canal, and the liver was of a more or less pale yellow. We might conclude from this bringing together of facts, that the characters of this epidemic were the same at its different periods. But the question is so important, that I must go deeper into the subject. After having given an example of the condition of the organs in a patient

examined the twenty-fifth of December, I shall relate the anatomical history of another patient, who died the 26th of November. If the lesions here are the same as those described in the first subject, we shall have proof that, at least in some of its characters, the disease was the same at two different periods of the epidemic.

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#### TWENTY-FIRST OBSERVATION.

*Autopsy the twenty-fifth of December at the Civil Hospital, twenty-three hours after death.*

EXTERIOR. — The body perfectly well formed, the *embonpoint* not remarkable ; moderate rigidity ; universal intense yellow color ; no stripes.

HEAD. — Very slight *sub-arachnoid* infiltration ; *cortical* substance of a rose grey color ; the *medullary* substance dotted with blood ; both of a good consistence ; a small spoonful of serum in each *lateral ventricle* ; the *cortical* substance of the *cerebellum* of a violet color ; the *pons varolii* and *medulla oblongata* natural.

NECK. — The *pharynx* of the color of onion parings ; its mucous membrane in other respects perfectly natural ; the *epiglottis* and *larynx* natural ;

the *trachea* of a light red behind ; its mucous membrane thin and of a proper firmness.

CHEST. — The *heart* of a good size, firm and of a natural color, containing very little liquid blood, without any concretions ; the *aorta* yellow without any redness through its whole extent, filled with liquid blood ; the *lungs* free, heavy, of a livid red and blackish posteriorly, firm at their base and behind, presenting in these parts internally, irregular masses of a variable size, of a blackish red, not manifestly granulated, easily penetrated as is the pulmonary tissue when in the first degree of hepatization ; some dilated vessels were found here ; the intervening parenchyma was soft, containing a red aerated fluid, and appeared to be in the first degree of inflammation.

ABDOMEN. — The *æsofagus* of a deep grey, its mucous membrane deprived of epidermis in its two lower thirds, perfectly natural in other parts ; no unusual development of the crypts ; the *stomach* yellowish externally, larger than usual by about two thirds. It contained nearly twenty ounces of a black fluid, with small flocculi, depositing, on standing half an hour, a black matter, formed as it were, of an infinity of grains of the same color, and above them a brown black fluid ; its mucous membrane was of a slight orange color, except over a surface of from seven to eight square inches near the pylorus, where



it was whitish, and in another spot of the size of the palm of the hand immediately above the great curvature, where it was yellow; directly opposite the pylorus, and to the right of the cardia, in a less extent, this membrane had a very marked mamelonated appearance. Anteriorly, we found thirty small ulcerations, of the size of a pin's head, like small holes; in the centre of most of these, the mucous membrane was completely destroyed, and in different points of the surface were numerous digital depressions and furrows, of the width of a pen mark, and from six to twelve lines in length. The thickness of the mucous membrane was increased in the superior and anterior halves, and it had a good consistence, giving strips of from three to four lines in the great cul-de-sac, of from six to ten in the middle part of its two faces. The valvular folds of the *duodenum* were of a rose orange color, its mucous membrane of a proper consistence and thickness; the sub-mucous crypts slightly developed; the *jejunum* contained a great deal of thick black matter, giving a red color to the sides of the vessel which held it; the *ileum* contained mucus only, of a natural color; the mucous membrane lining it, was of a yellowish white, softened, giving on traction for the length of two feet near the cœcum, strips of two lines only. In the rest of the small intestine, its consistence was natural, the *right colon* contained a small quantity

of thin livid red matter ; the mucous membrane of the *large intestine* was somewhat softened, and gave by traction strips of four lines in the first half, of from five to eight in the second ; the *liver* was of a moderate size, universally of a buff yellow, internally, as well as externally ; and externally, were points of a pale red color on a yellow ground. It was softened, less coherent than natural, and contained a little pale blood ; the *biliary ducts* were not remarkable ; the bile of the *gall-bladder* was of a deep green color, not abundant ; the lining membrane of this reservoir natural ; the *spleen* healthy.

The epidemic ceased on the 25th of December, so that no autopsy was made after that day, and that just given, with two others, which I made on the same day, was the last. The reader must have remarked, that it would be difficult to find a single fact in more perfect harmony with the general description given above of the lesions found at the autopsies of the victims of yellow fever. The lungs presented here some partial engorgements, the result of the effusion of a certain quantity of blood into their parenchyma. The stomach contained a black matter, the intestines a matter of a livid red color ; the mucous membrane of the stomach was thickened, mamelonated, red and ulcerated, manifestly inflamed ; the liver was of a uniform buff color ; so

that there can be no doubt of the character of the disease of which this patient died, the lesions being those of yellow fever, and those of other diseases not having been observed.

The following observation of the first subject examined by us at Gibraltar, on the 27th of November, will be a new proof of the identity of the lesions presented by individuals who died in the last month of the epidemic, The symptoms of this patient were noted by Dr. Barry, who had the kindness to communicate them to us.

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#### TWENTY-SECOND OBSERVATION.

CAMPBELL, a tailor of the forty-second regiment, æt. 40, complained two days before his admission into the Northern Hospital, of slight pains in the limbs, in the head and in the abdomen. At the same time the tongue was white, the thirst moderate, the pulse and the heat nearly natural. A powder, composed of a scruple of rhubarb and four grains of calomel, was given to him on his arrival. This powder was followed by several stools, and there was a slight amendment. In the evening there was nausea, and rhubarb was again administered.

During the night of the 24th, the patient had

several stools, and was troubled with nausea, efforts to vomit; the skin was of a slight yellow tint; he had no pain, he complained only of great debility; heat natural; pulse as before. In the evening, the yellow color was deeper than in the morning; no nausea; he was better and complained only of great weakness.

The next day, the 25th, he vomited black matter twice, and was seized suddenly with universal spasms. At eight A. M., his countenance was agitated; there was muttering delirium, he appeared insensible; the pulse hardly perceptible; the respiration laborious; the extremities cold; the deglutition difficult. He died the same day at four o'clock in the evening.

*Autopsy twenty-two hours after death.*

EXTERIOR. — A small quantity of frothy, blackish liquid flowed from his mouth; the cadaverous rigidity slight; deep universal yellow color; the *embon-point* moderate; the abdomen of a slight greenish tint; the muscles moderately colored, not flabby; no effusion of blood into their tissue.

HEAD. — The *dura mater* yellowish; the *sub-arachnoid* tissue very slightly infiltrated, of a blueish red on the lateral parts of the brain; the *cortical* substance of a very delicate red; the *medullary* moderately injected, and of a moderate consistence;

the *corpora striata* of a similar color to that of the cortical substance ; each of the *lateral ventricles* contained a small quantity of serum ; the cortical substance of the *cerebellum* of a more decided rose color than that of the brain.

SPINE. — Two to three spoons full of red serum in the lower part of the *spinal arachnoid* ; the *dura-mater* red in the corresponding points ; the *spinal marrow* less firm than usual through its whole extent, in other respects natural.

NECK. — The *tonsils* and the *larynx* natural ; the mucous membrane of the *air passages* thin and pale, and the subjacent cellular tissue of a bright red in a great many points.

CHEST. — The *pleuras* contained each about six ounces of a red and somewhat thick liquid, without clots ; the *lungs* were free and large, natural anteriorly, and alternately of a light and dark red posteriorly, externally, as well as internally, firmer than in the first degree of pneumonia and in the reddest points less so than in the second, some engorgement in the intermediate spaces, the section of them not presenting a granulated aspect. The *pericardium* was natural ; the *heart* flaccid and less firm than usual, containing only a small quantity of liquid blood ; the lining membrane of its left ventricle was of a dark red ; the *aorta* contained liquid or clotted blood, it was generally red, more so above the

sygmoid valves than elsewhere. This color penetrated partially the middle tunic, which was not remarkable in other respects.

ABDOMEN. — The whole intestinal canal was of greyish and brownish tints externally, slightly meteorized; the *stomach* of similar tints, rather augmented in size, and containing about ten ounces of a blackish liquid moderately thick, homogeneous, without clots of blood. Its mucous membrane was of a livid red color anteriorly, yellowish or bistre in the great cul-de-sac, of a blueish grey near the pylorus, through an extent of three inches, unequally mamelonnated in this last part; on the anterior and posterior faces of the stomach, were seven brownish bands, two lines in width, four, five and six inches long, interrupted at intervals; the mucous membrane here was very thin, of a little less than a line in thickness anteriorly, a little thicker near the pylorus, and in some points of the great curvature; its strips were from two to three lines long in the great cul-de-sac, from two to five on the anterior face; the mucous membrane of the *duodenum* had a slight uniform greyish tint, not spotted, and was of a proper thickness, and of a consistence less than usual; the *small intestine* contained a matter similar to that found in the stomach, not abundant, and quite liquid in the *jejunum*, more abundant in the *ileum*, and thicker towards the illeo-cæcal valve, in the neighborhood of



which it adhered to the mucous membrane for the length of two feet. This membrane was of the same color as that of the duodenum, it presented some arborisations and red lenticular spots through the four last feet, near the cæcum; these existed also, in the subjacent cellular tissue. The mucous membrane was softened in this last part, and its strips were from two to three lines in length; the *large intestine* contained a moderate quantity of blackish matter, less thick than that found in the last feet of the ileum; its mucous membrane was greyish, of a proper thickness, and its strips were from twelve to fifteen lines in length, except in the cæcum where they were five only; in the *colon* were six small red transverse bands, dotted over with small superficial ulcerations; there was no trace of ulceration in the small intestine, where it was difficult to find *Peyer's glands*; the *mesenteric* and *mesocolic glands* were natural, the *liver* was of a good size, a firmness greater than natural, and of an unequal yellow color deeper on the left than on the right side, of a gum color, interrupted by points of a lac red, and by the orifice of vessels from which flowed a livid red blood mixed with air; the surface of the cuts made in different points of this organ, were of a lustreless and dry aspect; the *bile* and the *gall-bladder* were not remarkable, the cortical substance of the *kidneys* was yellowish, the other viscera natural.

The symptoms in this case were mild, in all of them together, there was nothing to create an apprehension of a fatal termination of the disease, at least up to an advanced period. The same, as has already been remarked, was observed in several other cases of patients dying at a subsequent period. The reader undoubtedly remembers, how deceitful was the disease of Dr. Mathias, whose death occurred some time before that of Campbell. And can the lesions of two cases be more nearly the same, than these of this patient, and those of the subject of the preceding observation, who died a month later. The quantity and the character of the liquid found in the stomach were the same. The red thickened and mamelonated condition of the mucous membrane of the stomach was the same in the two cases. There was no remarkable difference in the lining membrane of the small intestines. The black matter found in these viscera was the same in both, and the alteration of the color of the liver was almost identical.

Can there be any doubt of the identity of the symptoms and lesions in cases observed at different periods of the epidemic ?

It remains to inquire, if the proportion of severe cases and the mortality, were the same at the different periods, for this double question answered, the problem which I have proposed to myself will be solved.

We cannot ascertain directly from the documents collected by ourselves, in how many cases the disease was mild or severe. We can find this out indirectly, by consulting the bulletins published daily by the public authorities, from the 11th of September to the 25th of December, inclusive. In these bulletins, the number of patients in the hospitals, the number of those in the city, the number of those entering, that of the convalescent, the number of those dead, that of severe, and that of mild cases, are given in as many separate columns. The number of severe and of mild cases among those who entered the hospitals, has not been given. The number of those under treatment each day in the hospitals and in the city has been given.

From these data, we can ascertain the number of days duration of the severe, and that of the mild cases for the different months. We can compare them, and substituting the severity of the disease for its duration, and certainly we may consider them equivalent, we shall know if the proportion of mild to severe cases was the same at the different periods of the epidemic.

1. In the city and military hospitals, between the 11th and 30th of September, there were 2,133 days of disease in the severe cases, and 1,948 in the mild cases.

2. In October, there were 11,072 days in the severe cases, and 6,331 in the mild cases.

3. In November, 4,387 of the first, and 2,629 of the second.

4. In December, 713 of the first, and 270 of the second : that is to say, the number of day's duration of severe cases was to that of the mild cases:—

1. In September,      1.094 : 1

2. In October,        1.74 : 1

3. In November,      1.35 : 1

4. In December,      2.65 : 1

Then, making the substitution which we have already proposed, we find that the proportion of severe to mild cases was nearly the same in October as in November. These two periods may be compared, several patients whose illness commenced in September, being under treatment in October, and several who became ill towards the close of October, being still so in November. And if the proportion of severe cases in the month of November is greater, this may be explained by the fact, that the month of September ought to give fewer of these cases to the month of October, than this last month to the month of November. In the same way an explanation is afforded, how it happens that a smaller number of severe cases existed in September, and a greater number in December, for in this month the severest cases of the preceding month or months

terminated, as well as those where the convalescence was the most protracted. Nothing of this sort took place for the month of September, the number of persons who became ill before the 5th of September not being known to the authorities.

It would seem, then, to result from this first class of facts, that the proportion of severe to mild cases was nearly the same at all periods of the epidemic of 1828.

As to the mortality, it results from the tables published daily by the Gibraltar government.

1. That in September 930 persons were declared ill of whom 150 died : —

2. In October,	3,050 were ill 703 died
3. In November,	1,040 patients 251 deaths
4. In December,	175 patients 47 deaths.

That is to say, according to the documents, the proportion of the deaths to the whole number of patients was nearly as follows : —

In September,	.16
In October,	.23
In November,	.24
In December,	.27

This proportion, for the most part, too great, as I have already shewn, was nearly the same for the

last three months of the epidemic, much less for the first than in the others. This is owing to the fact, that many more made their illness known to the authorities at the commencement of the epidemic, when there was less to do than in the months of October and November, during which many treated themselves without declaring their disease.

The conclusions from the documents collected by the public authorities are not invalidated in the point of view we are now considering them, by the documents collected by the commission.

Of	30	patients in August,	3	died,
	179	“ September,	26	„
	271	“ October,	37	“
	88	“ November,	8	“
	29	“ December,	2	

Thus, according to these documents, the mortality in these five months, was in the order indicated.

August,	.1
September,	.14
October,	.13
November,	.09
December,	.06

There certainly is a difference between these results, and those from the official documents. Still, it seems to me, that it is not difficult to explain and remove these contradictions, by taking into account



the number of those from whom the mean has been obtained at the different periods. Thus, in September and October, the number of patients with whose histories we became acquainted, was very great, and the mortality of these two periods is nearly the same. In the other months, the number of cases is much smaller, and here the mortality seems to be decidedly less. Now we must remember, that small mistakes may easily be made in ciphers of mortality, nay, that they are almost inevitable, and that a mistake of one, which would be of no importance where the number is large, would very essentially affect the proportions where the number is small. Supposing then, that a mistake had been committed for the month of August, and that instead of three in thirty, four in thirty, had died ; under this supposition, the mortality for August would have been nearly the same as for October. In the same way, the difference of the mortality for the month of December, can be made to disappear.

As to the argument which one might be disposed to draw from the very different numbers of persons who became ill at different periods of the epidemic, proving that the character and severity of the disease were not the same at these different periods, this argument amounts to nothing, inasmuch as this difference is explained by the cause of the disease, contagion or infection, which acted differently at the

commencement, in the middle and towards the close, of the epidemic.

We may conclude, then, that if on account of the errors in the official documents, and of the small number of facts collected by the commission, it is not possible to draw strictly exact conclusions either from one, or from the other, that the mortality of the disease and the proportion of severe to mild cases, were the same at different periods of the epidemic ; at least these documents, on a careful study, do not contradict that supposition, but, on the contrary, are favorable to it. The uniformity of the symptoms and lesions observed at different periods of the epidemic, seems to give an affirmative answer to the question ; Were the character and severity of the yellow fever of Gibraltar of 1828, the same at different periods of the epidemic ?

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## CHAPTER IV.

### DIAGNOSIS.

If we admit that the practice of medicine rests, in great part, on the diagnosis of diseases, and that, for this reason, we cannot insist too much on it

in the most common cases ; how much more true is all this, when we have to do with epidemic disease, contagious, or non-contagious, to be arrested by isolation, or by removal from particular localities where it has broken out. In such cases an ignorance of the character of the disease leads to a fatal inaction ; whilst by an early knowledge of it, many lives may be saved. It is on this account that I think I cannot study too carefully, or too minutely, the symptoms and the lesions presented by the patients whose histories we have collected, in order to ascertain what were the characteristic symptoms of the yellow fever of Gibraltar of 1828. For we have some reason to believe, that, the diagnosis of this disease being well established, that of yellow fever in general will be so, this epidemic of Gibraltar, having been looked upon by physicians who had practised in the Antilles, as perfectly similar to the yellow fever observed by them in those islands.

The general description given at the commencement of this part of my researches, has already shown that the diagnosis of yellow fever may present great difficulties in severe cases. I shall first consider these cases, I shall then ask how the mild cases may be distinguished, and those in which almost all the characteristic symptoms of the disease are absent.

## I. IN SEVERE CASES.

In the most common cases of this kind, the patients experienced, at the commencement, headache, a pricking sensation in the eyes, which became almost immediately red and suffused; pains in the limbs, and more or less marked febrile symptoms. These symptoms continued. To them were joined pains in the epigastrium; nausea; spontaneous vomitings some twelve or fifteen hours afterwards, rarely earlier, and sometimes, even later. They were accompanied by an anxiety very variable in degree, so that some of the patients were constantly restless, and could not remain quiet in any posture, at the same time, their intellectual faculties not being deranged. On the third or fourth days of the disease, the eyes became yellow, the skin was of a similar color, the injection of the conjunctiva diminished, and the stools were blackish. If the disease terminated in recovery, the stools resumed their natural color, the vomitings became less frequent, or ceased entirely, and with them the pains and uncomfortable feelings. In fatal cases the vomitings continued, they became more or less blackish or completely black, the dejections were of the same color, the yellowness increased, the heat forsook the limbs, and from twenty to thirty-six hours after the super-vention of this state of things, sometimes sooner,

sometimes later, that is to say, four or five or six days after the commencement of the disease, the patient died.

Should a patient, then, exhibit the symptoms which have just been enumerated, should he inhabit a country in which the yellow fever has been observed, or only a city, the latitude of which is comprised between the limits in which the yellow fever has been observed, we might be almost certain that he was attacked by that disease; for these are the symptoms which have been observed by us in a great majority of cases of yellow fever, and they do not belong to any other disease, as we shall soon clearly see.

Still, in cases where the patient recovered, there might be some uncertainty, for in these cases the black vomit, for the most part, is wanting, and the other symptoms, considered singly, are not pathognomonic, not even the black or blackish stools, which are found in some cases of typhoid fever, nor the yellowness, which is one of the principal symptoms of hepatitis, and which also is found in patients suffering from other acute diseases. But this uncertainty must soon disappear, for we see, that though some of the symptoms of other diseases, are identical with those of yellow fever, the symptoms taken together, and their progress, are very different. In hepatitis, there is yellowness, but with it there are

also more or less severe pains in the right hypochondrium, and an increase of the volume of the liver, which does not take place in the yellow fever. Then, the more or less severe headache at the commencement, the injection of the eyes, the anxiety, so usual in yellow fever, are not observed, and again the course of the last disease is so much more rapid. On the other hand, though in typhoid fever the stools are sometimes brownish, this is not often the case, and takes place at a period more or less distant from the commencement of the disease. Then, in proportion as vomitings are common in yellow fever, they are rare in typhoid fever, or are observed only at an advanced period of the disease. A diarrhœa, more or less abundant, is found in the very great majority of cases of typhoid fever, and usually also at the commencement of the disease, whilst an opposite condition of the bowels is observed in yellow fever. The form of the abdomen is natural in this last disease; it is altered, and usually there is meteorism, in the other. The one is accompanied by eruptions on the surface of the body, by delirium, prostration, intense febrile symptoms; an opposite state of things prevails in the other disease. Again, typhoid fevers terminating in recovery, are slow in their course, whilst the duration of the yellow fever is much shorter.

Gastritis may be distinguished from yellow fever,



quite as easily, although gastritis is very frequent in this last disease. In both diseases there are vomitings more or less frequent, accompanied by epigastric pains ; but the course of simple gastritis is much less rapid than that of yellow fever. It is rarely accompanied by severe symptoms, by that great anxiety, which is common in yellow fever, even when the patient recovers. The yellowness is sometimes found in the first disease, but only as an exception, and the black or blackish stools are not observed at any period. Nor is the remarkable injection of the eyes to be seen in gastritis, so that, as I have just said, with the slightest attention we can hardly confound the two diseases. In fatal cases, the addition of the black vomit to the other symptoms, would leave no doubt, and the autopsy would complete the demonstration, by the exhibition of certain lesions, of the importance of which I have already said enough, and especially of that of the liver, which does not exist in any other disease, and which forms the anatomical character of the yellow fever.

And if any new or strange symptoms should be superadded, as we have seen that in one case there was stupor, the diagnosis would be obscured only for a moment.

For a short time we might think that a typhoid fever was commencing, but a consideration of the other symptoms, and the early convalescence in

cases of recovery, would remove all doubts. And where the patient died, the condition of the organs would lead to the same result.

There is then no real difficulty in these cases; but in others not less severe there might be some before the autopsy. For example, we might have somewhat such a case as that of Scott, no anxiety, no yellowness of the skin, the eyes nearly natural. Though death in such a case should occur after an illness of six days, and the symptoms of no other disease should have been presented; we could not be certain before the autopsy that such a patient died of yellow fever. And if, at the autopsy, the attention had been exclusively directed to the intestinal canal, and black matter had been found in the colon only, we might doubt of the character of the disease; the exhalation of blood in the colon taking place, although rarely, in patients dying of other acute diseases. But if the liver be examined, and this organ be found of a more or less pale yellow, its cohesion and consistence natural or increased, all doubts would be removed. Thus, in some cases, anatomy alone can make us certain.

The following observation is a new example of the difficulties which the diagnosis may offer at the commencement of the epidemic in severe cases terminating fatally, for it is in such cases only, that a false diagnosis can become a public calamity.

## TWENTY-THIRD OBSERVATION.

JOHN BOVIN, an artillery soldier, æt. 22, two years at Gibraltar, was admitted into the Artillery Hospital the 7th of December, 1828, and was placed in the wards appropriated to patients violently delirious. He had been at work in the hospital since the month of September, had enjoyed good health, except during a slight indisposition fifteen days before his present illness. Two days before his entrance into the hospital, uneasiness, universal heaviness, diminution of appetite, yet without diminution of food. In the night of the 6th and 7th of December, chills, cramps, pains in the limbs. Two hours and a half later, the chills were followed by considerable heat, sweat, headache, dizziness, intense thirst, no epigastric pains. The 7th, when the patient was brought to the hospital, the heat was considerable, the deglutition difficult, the palate and the tonsils dry and red; his throat had been sore during the last thirty-six hours.

Venesection to the amount of  $\text{℥ xij}$ ; pills of calomel, scammony and jalap, eight grains each; were prescribed. Two hours later, two ounces of castor oil were given him, which were vomited. The blood was covered by a thin yellowish semi-transparent clot, having no consistence, and the next day

the patient's countenance had an expression of astonishment, his answers were exact, the eyes of a slight green yellow color, not injected; the headache diminished since the bleeding, the lips at times trembling, the tongue red and thick, sometimes tremulous, the deglutition difficult, the velum palati pendulous and red, the left tonsil voluminous and of a bright red, the form of the abdomen natural; nine dejections; the pulse tolerably large, strong, one hundred; the heat increased, no dryness; the chest somewhat injected; some rose lenticular spots, a line in diameter on the abdomen; ringing in the ears. Pills of a grain and a half of calomel and two grains of James' powder, every two hours. Demulcent drinks.

The next morning the patient vomited an egg almost as soon as he had eaten it, and he got up alone to go to the stool, although he appeared much prostrated. The edges of his tongue were dry; his pulse small, easily compressed, eighty-five; his temperature natural; the eyes and upper part of the body yellow. He died the same day at six o'clock in the evening.

*Autopsy twenty-two hours after death.*

EXTERIOR. — An athletic form, no ecchymosis on the lateral or anterior parts of the body; slight yellow tint on the abdomen, more marked on the trunk

and on the face, scarcely appreciable on the limbs. No further trace of putrid decomposition; the *muscles* not flabby, of a good color and consistence.

HEAD. — The *dura mater* a little yellowish; the *arachnoid* and *pia mater* natural; the *cortical* substance of the brain of a rose tint; the *medullary* substance injected; two small spoons full of serum in the *lateral ventricles*; the cortical substance of the *cerebellum* of a deeper rose tint than that of the brain.

SPINE. — A little clear serum in the *spinal arachnoid*, the *spinal marrow* and its membranes natural.

NECK. — The mucous membrane of the *epiglottis* somewhat swollen, that of the *tongue*, of the *trachea*, of the *pharynx*, and of the *æso-phagus*, perfectly natural.

CHEST. — The *heart* somewhat larger than the fist of the subject, flaccid, firm. The right cavities contained a great deal of liquid blood, and some yellowish fibrinous concretions; in the left cavities there was liquid blood only; the lining membrane of these cavities natural; the *aorta* of a very marked lemon yellow color internally; the *large vessels* uniting the heart and the lungs contained a good deal of black liquid blood; the *lungs* were free, not remarkable anteriorly, but on the middle and posterior part of the left lung were circumscribed points of a blackish red color, of a variable size, which were owing to an effusion of blood that could

be easily pressed out of it. The pulmonary parenchyma was the seat of no other alteration.

ABDOMEN. — The *stomach* of its usual size, contained four ounces of a blackish fluid, slightly tinged with red; its mucous membrane was nearly of the same color, generally of a deeper red, a cherry red, or crimson color, till within three or four inches of the pylorus, where it was of a greyish yellow. The red color was lighter on the free edge of the folds. The consistence of the mucous membrane was diminished; strips of it were obtained of from two to five lines in length, except near the cardiac orifice, where, in a small extent, they were of from eight to ten lines. The mucous membrane of the *duodenum* was of rather a deep red for a third of its length, counting from the pylorus, where its color was natural. It was covered by a whitish mucus of the consistence of flour paste. The same kind of mucus was found in the *small intestine*, the mucous membrane of which gave strips of from four to six lines, and was of a yellowish white color, except in the six or seven last feet, where it was greenish, or of a wine-lees color, very much softened, so that no strips could be obtained. Besides the mucus, which was of the color of the corresponding mucous membrane, the intestine contained in the part near the cæcum, for the length of twenty inches, a soft substance resembling putty. *Peyer's* and *Brunner's glands* were



not the seat of any alteration. The mucous membrane of the *large intestine* was of a greyish yellow tint. Its strips in the *cæcum* and *right colon* were of from four to six lines, and of from ten to fifteen in the transverse and descending colons. The *mesenteric glands* were natural, one near the *cæcum* excepted, which was red, friable, and of triple its usual size. The *liver* was of a proper size and firmness, being easily torn. Its concave surface was marbled with red; its convex surface of a greenish yellow, which penetrated some lines into the substance. The right lobe had internally a red tint, mixed with yellowish points; the left lobe, on the contrary, was of a yellow color, interrupted by delicate rose points. The *gall-bladder* was natural; the *bile*, which it contained, of an olive green, not viscous. The *spleen* was flaccid, softened, of a brown red color, and of twice its usual size. The *kidneys* and the *bladder*, were perfectly natural.

On account of the rapidity of the disease, of the yellowness, and of the epidemic of yellow fever which was then prevailing, the patient was regarded as suffering under an attack of this disease. But this would not have been so, at least no positive determination of the nature of the disease would have been possible, during the life of the patient, had his illness come on at the commencement of the epi-

demic. For, excepting the yellowness, Bovin presented no symptom characteristic of the yellow fever, neither black vomit, nor black dejections, nor that great and inexpressible anxiety which some patients experience in the course of that disease. On the other hand, the slight degree of stupor might have led an inexperienced physician to the belief, that the disease was typhoid fever. And the liver in the yellow fever not having, as yet, as it seems to me, properly arrested the attention of pathologists, the embarrassment and uncertainty might not have ceased after the death. The integrity of Peyer's patches would have removed the suspicion that the disease had been a typhoid fever; but the absence of black matter in the stomach and intestine, would have made one renounce the idea of yellow fever, if that idea had previously occurred. Nevertheless, here, as in several of the other cases, the examination of the liver, and the consideration of the rapid progress of the disease, could alone lead to an exact knowledge of its nature. It follows, then, that at the commencement of an epidemic of yellow fever, some of the patients manifesting all the symptoms which characterize this disease, or these symptoms not being found in a sufficient number to enable us to form an exact diagnosis, we may always have a confirmation of our diagnosis by an examination of the organs, and particularly of the liver, which, the

intestinal canal not containing any black matter, may be the sole organ especially affected. This conclusion shews how important it is to study the condition of all the viscera, and to determine if any of them be always affected and in the same manner. We should add, that this applies rather to patients dying after a disease of some duration ; for instance, after an illness of three days, as those dying in less time might not present any appreciable characteristic lesion.

It is by these means only, by the aid of pathological anatomy, that we can appreciate the true character of the disease in such patients as the subject of the following observation, who did not vomit, who betrayed no anxiety, and in whom spasmodic rigidity was the severest symptom.

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#### TWENTY-FOURTH OBSERVATION.

JAMES NEWAT, æt. 23, of a strong constitution, an artillery soldier, two years at Gibraltar, was admitted to the hospital the 28th of November, ill since the evening of the day before. Employed at the southern gate, he had had no duty out of the camp, and he attributed his disease to some exposure to cold, during the night, in his tent.

At the commencement, without precursory symptoms, chills, followed after an hour's duration by a moderate heat without sweat, pains in the legs, drowsiness. No other pain at this period, neither of the head, nor of the loins, nor of the epigastrium. A purgative was administered to the patient soon after his entrance into the hospital, which was followed by four stools.

Pills of calomel, scammony, and jalap, grs. viij; an ounce of castor oil two hours later. Pills of calomel and James' powder, grs. vij. with a quarter of a grain of the gummy extract of opium, every three hours.

The 29th, as we were asking him if he knew where he was, the patient was seized with a violent spasmodic rigidity in the arms and fore arms, which compelled him to sit up immediately, the lips tightly compressed, allowing only a little frothy saliva to escape. These symptoms disappeared, having continued one or two minutes only, then came on again, but less violently, and sleep following immediately the relief from them, we were unable to question the patient. We remarked only, that there was no redness of the eyes.

Besides the calomel and James' powder pill, an ounce and a half of castor oil with a drachm of the tincture of senna were prescribed, to be taken immediately.

In the evening, the skin and the tongue were dry, the pulse depressed, seventy-six. Two stools of a greyish color, followed the administration of an enema. There were colic pains, and a continual drowsiness.

The morning of the 30th, the drowsiness was more marked, although the patient was easily roused from it; anxiety at intervals, and various motions to the right and left; repugnance to mental action, scarcely any answers, by yes and no; the pulse small, feeble, somewhat irregular, eighty-eight; the heat slightly increased, a frequent desire to go to stool. Death at midnight.

*Autopsy fourteen hours after death.*

EXTERIOR. — Universal but not deep yellow color; the *embonpoint* slight; a well formed subject; cadaverous rigidity inconsiderable.

HEAD. — *Sub-arachnoid* infiltration red or limpid, somewhat thick; the cerebral *veins* distended by a moderate quantity of blood; the *cortical* substance of the brain of a natural color; the *medullary* injected in a remarkable manner; both of a good consistence; a little less than two spoons full of reddish serum in each lateral ventricle. Two spoons full of the same liquid at the base of the brain; the *pons varolii*, *cerebellum*, *medulla oblongata*, natural.

SPINE. — Two or three spoons full of limpid

serum at the lower part of the *spinal arachnoid*; the *spinal marrow* of a proper thickness, color and consistence, through its whole extent.

CHEST. — Less than a spoonful of yellowish serum in the *pericardium*; the *heart* of a natural size and consistence; the ventricles contained a moderate quantity of fluid blood, and some fibrinous clots of a deep yellow color; blackish non-fibrinous clots were found in the *aorta* which contained liquid blood besides, and was of a marked yellow color through its whole extent; the *pleura* was natural, no effusion in the pleural cavities; the *lungs* large, of a natural color anteriorly, of a dark red posteriorly, externally as well as internally, neither engorged, nor hepatized, nor splenified. On one of them, on its middle and posterior part, under the *pleura*, a blackish spot eight lines in width was seen, and this penetrated rather deeply into the thickness of the organ; the corresponding tissue was almost homogeneous, hard, not moist, not granulated.

ABDOMEN. — The *peritoneum* healthy; no effusion in the cavity of the abdomen; the *æsophagus* almost deprived of epidermis, its mucous membrane of a bistre hue, in other respects perfectly healthy; the *stomach* was of a moderate size, and contained a small quantity of greyish liquid; its mucous membrane was velvety, neither mamelonated nor unequal in any point; it had a slight orange tint in its pyloric



half, and in the superior half, presented narrow bands of a carmine red color, as if ruled ; its consistence and thickness were natural ; the *duodenum* was of a moderate size, and a pale red color, its vessels were somewhat injected, its mucous membrane of a proper thickness, the crypts slightly developed, the consistence almost natural ; the *small intestine* was of its usual size, and contained a moderate quantity of a brownish scarcely viscous fluid ; in the first half of the intestine there was a moderately thick layer of a yellowish mucus, its lining membrane was moderately injected at intervals, of a greyish color in some points, natural almost everywhere ; its strips were from three to five lines long through its whole extent, and its thickness in the ileum could not be attributed entirely to the small size of the intestine, which was contracted in this part ; *Peyer's patches* were natural, *Brunner's glands* invisible ; the colon not remarkable externally, contained a greyish, moderately thick, and not very abundant, matter ; its mucous membrane generally greyish, of a slight livid red color in the *rectum*, of a proper thickness, and its strips from the cæcum to the anus were of from three to six lines ; the *mesenteric* and *mesocolic glands* natural ; the *liver* of its usual size, less firm than natural, and its color to the right of the suspensory ligament was natural. To the left of this ligament the liver was yellowish ; in the interior of its right

lobe, and near its sharp edge, there were some yellow spots, elsewhere its color was natural; the left lobe was of an olive yellow color through its whole thickness, its cohesion was increased, that of the right lobe was natural. Both lobes, and particularly the middle one, contained little blood; the *gall-bladder* of a moderate size and perfectly healthy, the liquid in it, was of a deep green color, of a good consistence, and the *biliary ducts* were not remarkable; the spleen of double its usual size, of a deep color internally, more consistent than natural. The other viscera of the abdomen were not remarkable, excepting the *kidneys*, the cortical substance of which was yellowish and streaked with red through its whole thickness.

As I have said, this patient did not vomit, was not anxious, had no black dejections. The spasmodic motions were his most striking symptoms. The symptomatic expression of the disease was very different from that usually presented by the yellow fever, nevertheless we must admit that the patient fell a victim to that disease. And though the characteristic symptoms of the yellow fever were wanting, none, characteristic of any other disease, were present. The progress of the disorder was rapid, as is that of the yellow fever, the patient was yellow; and at the autopsy, the mucous membrane of the

stomach was nearly natural. No black matter was found here, nor in other parts of the alimentary canal, the liver presented the lesion which has been described, and there was no alteration which could lead to the suspicion of any other disease.\*

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\* I place the following observation in a note, because it is anatomically incomplete, and for that reason and some others, it may be asked if the subject of it really died of the yellow fever, or of some other disease, the seat and nature of which cannot be determined; this happening sometimes, though rarely. Indifferent to the result, and having merely the truth in view, I have wished to place before the reader all the materials which have served to establish my own convictions, and for this reason I have been unwilling to conceal a fact which is incomplete in several particulars, as has already been said.

Haymand, a sergeant of the twenty-third regiment, æt. 29, nine years a soldier, had always enjoyed good health till just before he was admitted to the Marine Hospital, the 18th of December, 1828. A writer in the office of the colonel of the regiment, he assured us that he had not been in the city since the encampment on the Europa Flat. He had visited a comrade in the hospital, another comrade who lived with his wife in the Rosia quarter, and also the tailor of the 23d regiment. He had left the camp by means of a permit which he had obtained fraudulently.

On the night of the 16th, whilst walking in the camp, he was seized with a chill and shivering, and a considerable weakness in the limbs; these symptoms continued the succeeding night, and were soon followed by vomitings and headache.

The morning of the 17th, the fever was considerable, and the patient took, in one of the tents of observation, pills of calomel and colocynth, and subsequently an ounce and a half of castor oil. Numerous stools followed the administration of this medicine, after which the vomitings and the headache disappeared. On the morning of the 18th, diaphoretics were prescribed, and the patient, the same day, before entering the hospital, had several stools and some nausea.

In mild cases, all the more or less characteristic symptoms were often wanting. Frequently there were no vomitings of any kind, never black vomit,

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The morning of the 19th, the eyes were injected, the countenance red, the skin burning, the pulse small and frequent, the thirst intense, the tongue whitish, its central part coated, its edges of a clear red color; nausea and vomitings at intervals. He did not complain of any pain.

Effervescent draught every three hours, with drops of æther and the tincture of digitalis three times a day.

There were several stools in the day and evening. At eight o'clock, the symptoms were the same as in the morning. During the night, the restlessness was extreme, the nausea and the vomitings very frequent, as soon as any thing was taken. He had some delirium, and wished to leave his bed several times.

The morning of the 20th, the restlessness continued; there was anxiety, the answers were quick and sometimes strange; the pulse small, accelerated, and hardly sensible; the extremities rather cold; the tongue less coated than on the preceding day; the thirst intense; a sensation of fulness at the epigastrium: the urine small in quantity; the nausea and vomitings continued; the patient thought that he would do very well if he could sleep.

He was delirious and restless the whole day; he had not urined since the morning and had vomited a black fluid, when seen at eight o'clock in the evening. He was then quiet, and he died a half an hour later, his arms folded on his chest.

*Autopsy the 21st of December, sixteen hours after death.*

EXTERIOR. — The stature and the *embonpoint* about the average; the muscular prominences well marked; the countenance and the sclerotic of a slight yellow color. The rest of the body, from the head to the feet, of the usual color. Every where, on the lateral parts of the trunk, bands of a livid red color, from one to two lines in width, were seen marking the passage of vessels, to which they manifestly corresponded, or else to the imbi-

nor black dejections, nor yellowness, nor anxiety. The disease appeared to consist of some slight febrile symptoms, to which were joined a more or

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bition of blood, which colored in the same manner the cellular tissue placed between the veins and the skin.

HEAD. — The vessels of the *dura mater* were marked on its external surface, as those of the sub-cutaneous cellular tissue on the skin. The *arachnoid* contained about a small spoonful of livid red serum. The *sub-arachnoid* tissue was much infiltrated by a similar liquid, and its thickness increased laterally, where it was almost two lines. The *pia mater* was easily removed, except at the lower part of the anterior and middle lobes of the right side, of which we shall soon speak. The firmness of the brain externally was natural, its cohesion less than usual. Its *medullary* substance was dotted by several red spots of a line, more or less, in diameter, at the centre of which a redder point was found. The lateral ventricles contained, each, one and a half spoons full of clear bright red serum. At the lower part of the anterior and middle lobes of the right side, there were from twelve to fifteen yellowish depressions of the color of rancid lard, from one to three lines long, by two to three in width; the *pia mater* was wanting in great part on their surface, some filaments of it only remained, and at their edges, in tearing it away, a part of the grey substance came with it. These depressions offered a remarkable resistance to the touch, so that both in hardness and color, they resembled the recent wounds of blisters, which are found on dead bodies, and which have been laid bare during a certain time. In the corresponding points, the *cortical* substance had lost a third or a quarter of its thickness. The *medullary* substance preserved its natural color; its consistence was greater than that of the surrounding parts. The sub-arachnoid tissue of the cerebellum was infiltrated like that of the brain; the consistence of this viscus was less than usual; the *pons varolii* and *medulla oblongata* were not remarkable.

SPINE. — The *dura mater* was of a clear and livid red through its whole extent. There were about two spoons full of serum, of a pale red color in the lower part of the *arachnoid*, and the *spinal*

less intense headache, pain in the limbs, back and loins ; sometimes, usually even, redness of the eyes ; a weakness so moderate, that many patients did not

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*marrow* was flaccid through its whole extent, without having lost its cohesion.

**CHEST.** — The *pericardium* contained a spoonful of reddish serum. The *heart* was somewhat flaccid, of a moderate size ; its tissue was less red, and dryer than usual ; its left ventricle contained a fibrinous clot, yellowish, easily torn, and a small quantity of liquid blood ; the mitral and tricuspid valves were of a very deep livid red color ; the *sygmoids* of a lighter color. The *aorta* contained a moderate quantity of liquid blood, was of rather a uniform cherry red internally, and this color extended through the whole thickness of the middle coat, diminishing in intensity towards the external coat. The left *lung* presented some old cellular adhesions ; it was of a blackish red and livid color, partially on the sides, and everywhere posteriorly, where, as well as the right in the corresponding parts, it contained a small quantity of well aerated blood. Neither of the lungs was splenified or hepatised, in any point. The *pleuras* contained no serum. The *trachea* was of a livid red color throughout ; its mucous membrane in other respects natural.

**ABDOMEN.** — The *epiploon* was somewhat loaded with fat, and red in some points. The *small intestine* was of a slight rose color near the duodenum and greyish further down. The *æso-phagus* deprived of its epidermis through the greater part of its extent, was not remarkable in other respects. The *stomach* was of a moderate size, and contained a small quantity of mucus ; its mucous membrane was of a grey color, deeper on its anterior face, than in any other point, and much deeper than in the pyloric region ; it was whitish and semi-transparent around the *æso-phagus*, in the width of two inches and a half ; two red bands somewhat injected, from fifteen to twenty-five lines in length, formed by the union of more or less confluent points, were found in the small curvature, and none were seen elsewhere. The mucous membrane, wherever it was grey, had a slight mamelonated appearance, but



keep their beds. In cases of this sort, occurring at the commencement of an epidemic, the character of which has not been recognised, and where the patients observed are isolated, it is not only impossible to

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was of a proper thickness. Its strips were from eight to twelve lines long in the width of two inches in the great curvature, and from one to four lines through the rest of its extent. The *duodenum* was natural, and the *small intestine* contained a moderate quantity of mucus. Its lining membrane was greyish generally, greenish in some points of the ileum, and of a delicate rose color about the valves, and in the greater part of the jejunum; its thickness was natural, and through its whole extent, even near the duodenum, its strips were from five to six lines in length. The *large intestine* contained a moderate quantity of pultaceous fœcal matter; its mucous membrane was generally of a greyish tint, and in some points greenish; it was thin and of a natural consistence, and it gave strips of from twelve to fifteen lines. The *liver* was of a good size, a less consistence than usual, so that the finger penetrated it easily; it was of a universal pistachio color externally, as well as internally, and on it were seen an infinity of small whitish spots, irregularly round, of about a line in diameter. The *biliary ducts* were natural, the bile of the *gall-bladder* less abundant than usual by one half, thin, the gall-bladder itself natural. The *kidneys* were of a pale orange red, more easily torn than usual. The *bladder* small, of an orange red color, slightly and unequally so; its mucous membrane was in other respects perfectly natural. The *spleen* small, of a very deep color, moderately softened. The other viscera were not remarkable.

The omissions, of which we spoke, before giving this observation, are in the description of the contents of the intestinal canal, the color of which has not been given. It is however highly probable, that as this color was not noted, it was natural, and admitting this supposition to be true, the body of this man did not present any lesions peculiar to the victims of yellow fever, for though the liver was altered, its lesion differs much from that I

recognise the disease, but we should scarcely even suspect it. It might be taken for an ephemeral fever, the character of which cannot always be determined, or in cases where the febrile symptoms are accompanied by epigastric pain and nausea, the disease might be considered a slight gastritis; and although, according to my own observation, the return of strength does not take place in yellow fever patients, after a space of time proportioned to the symptoms and the duration of the fever, still, so many causes may retard convalescence from the

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have described and seen in all the other cases. Were the appearances of that lesion altered by the particular disposition of the subject, which allowed the blood to exude along the sub-cutaneous veins, and in the thickness even of the cerebral substance? This question is entirely insoluble in the present state of science, so that, as has been already said, we cannot strictly determine the kind of disease of which the patient died. The progress of it was rapid, there were nausea, vomitings, anxiety, some of the vomitings were said to be brownish or black, but even supposing this last expression to be exact, a characteristic symptom of the yellow fever is not denoted by it. On the other hand, the yellowish tint was confined to the countenance and eyes, so that neither the symptoms nor the lesions are sufficient to enable us to assign its true character to the disease, nor the place it should occupy in the nosological table.

As to the alteration of the cortical and medullary substances of the brain, in a part of their extent, (a very rare lesion which I have not observed more than four times in France,) I have as yet said nothing about it in the remarks which I have made on the case, because it presented every character of an old lesion, and undoubtedly had nothing to do with the death of the patient, nor with the symptoms of the last illness.

most common diseases, that we could not suspect the yellow fever from this consideration alone. But if many similar cases were observed in a short space of time, in the months of August and September, and in the latitude where the yellow fever prevails; if the eyes were injected from the commencement, the countenance red, the headache intense, the epigastrium sensible on pressure, we should strongly suspect this disease, although the existence of an epidemic had not been declared. There would be no doubts as to this point, even if the symptoms existed in the slightest degree only, where the disease attacked all the members, or the greater part of the members of one family in the midst of an epidemic, and in a short space of time; since, of diseases of this kind, there is no other than yellow fever, which would attack a great number of persons of the same family in so short a space of time. I shall give other reasons for this opinion in the following chapter.

Thus, first in severe and fatal cases, the diagnosis can present no real difficulties during the life of the patients in the greater number of cases, on account of the rapid course of the disease, of the black vomit and dejections, of the yellowness and extremely uncomfortable feelings. There could be doubt in those cases only, where the course of the disease was slow, where there was neither black vomit nor

yellowness, and this rarely happened ; or where the disease was presented under one of the forms already referred to, and of which I have given an example. An attentive examination of the organs would remove these doubts, since in the great majority of cases, we should find a greater or less quantity of black matter in the stomach and intestines, and always — that is, it has been so in the facts we have observed — a specific alteration of the liver.

Secondly, in severe cases, where the patient recovers, doubt would exist under the same circumstances, as in fatal cases before the autopsy ; that is, where the course of the disease had been different from that it usually follows, and where there was no yellowness. And doubtful cases ought to be frequent, considering the infrequency of black vomit in patients who recovered.

Thirdly, in mild cases, where the more or less characteristic symptoms of the yellow fever are absent, a diagnosis is possible only when several persons of the same family manifest almost in the same time, the same symptoms, an epidemic prevailing.

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## CHAPTER VI.

DOES A FIRST ATTACK OF YELLOW FEVER PRESERVE FROM A  
SECOND?

THIS point of view in the history of yellow fever is not new. Some of the physicians who have studied the disease, and the populations amongst which it has prevailed in times past, have remarked that the same person is rarely attacked twice by the yellow fever. Sauvage, in his *Methodical Nosology*, says positively, that this disease attacks the same person once only. Arejuta expresses himself to this effect, and it results from inquiries made by Dr. David Hosack, of physicians who had practised at New York and Philadelphia, that they had never been called on to treat a patient suffering from a second attack of yellow fever.

Michael Cabanellis expressed a similar opinion, in a work published at Mieri, in 1812, on the laws to be instituted to prevent the reproduction and importation of the yellow fever. Valence says the same thing in his *Historical and Medical Researches on the Yellow Fever*, published in 1805, for, notwithstanding the pains he took to inquire and to settle doubts as to this point, he found no individual, French,

English or American, who had had the yellow fever twice.

However, the question which I consider in this chapter had not, perhaps, sufficiently occupied the attention of physicians, nor had it been made the subject of an especial work, when it was carefully examined in 1815, by Dr. Pym, who presented an important work on it to the London College of Physicians. A report was made on this work, in which it was said, amongst other things, that although, according to the facts presented, there was strong ground for the belief that a first attack of yellow fever preserves from a second, it would be necessary to collect the opinions of a greater number of physicians in order to come to any certain conclusion; so that, at the period when this report was made, in London at least, the preservative influence of a first attack of yellow fever was not looked upon as demonstrated. It was then necessary to collect new facts. To do this, and to comply with the wishes of the College of Physicians of London, Sir William Pym, physician in chief of Gibraltar for the time, recommended to General Don, when the epidemic of 1828 had ceased, to appoint a commission, whose duty it should be to collect such facts as might serve to settle this point. Messrs. Chervin and Trousseau, and myself, had the honor to be of this commission, which was composed of thirteen



physicians.\* I was appointed the President, M. Trousseau the Secretary, and Dr. Barry the Vice President.

The commission, as we shall see, neglected nothing which could lead to the knowledge of facts, and the establishment of strict conclusions. As some physicians thought that the preservative influence of a first attack of yellow fever, real for those who did not change their climate, was lost after a longer or shorter residence in a different climate, the question to examine became twofold. We inquired then,

1. If an individual, who had had the yellow fever in Europe, was susceptible of a second attack of the same disease in Europe ; 2. If an individual, who had had the yellow fever in Europe, could have it a second time in America, and vice-versa. As simple assertions were inadmissible, the commission decided that they would receive those cases only, in which the symptoms of the first and second attacks could be

\* Dr. BROADFOOT, Sub-Inspector of the Hospitals.

“ DORR, discharging the duties of Sub-Inspector.

“ BARRY, discharging the duties of Physician to the Forces.

Mr. DIX, Staff Surgeon.

“ FRAZER, Surgeon of the Civil Hospital.

Dr. ARDEVOL,

“ BOBADILLA,

“ MUTROS,

“ BOUVIER,

“ THURSTON,

} Chosen by the resident Physicians of  
Gibraltar.

given, whether these symptoms had been noted by the physicians who communicated them, or whether they came through the patient himself, but were unequivocal. In order to learn the proportion of patients who had had the disease twice, the commission asked of the physicians to state, and with as much precision as possible, the number of patients treated by them in the different epidemics.

As too many facts relative to the object of inquiry could not be collected, all the medical men of Gibraltar, civil and military, were invited to come before the commission, and to communicate the results of their experience. They all complied with this invitation, and answered the questions which were addressed to them successively by the different members of the commission. Thirty-three gentlemen were called upon to say : *first*, how many cases of yellow fever had been observed by them in the last, or in anterior epidemics, in Europe and America ; and, *secondly*, the number of patients, in the different epidemics, who had the yellow fever twice, and their symptoms. Most of these physicians had observed the yellow fever in Spain only ; some, however, had seen different epidemics in Europe and America, and the number of patients seen or treated by them all, amounted to somewhere about twenty-seven thousand.

Mr. Amiel, surgeon of the twelfth regiment, who

had observed the four last epidemics of yellow fever in Gibraltar—those of 1810, '13, '14, '28—presented two cases of presumed double attack to the consideration of the commission.

The Anglo-French commission, this was the name given at Gibraltar to the commission composed of the physicians sent from France and of Dr. Barry, had in its researches collected the symptoms manifested by nine individuals, who had been ill during two epidemics of yellow fever. Two other cases of presumed double attack were communicated to the commission, who thus had to deliberate on thirteen cases, and each of the members expressed his opinion by a vote, writing on a piece of paper, evident, probable, doubtful, or inadmissible, for each case.

In this manner, one of the cases of double attack communicated by Mr. Amiel, was declared evident, three were regarded as probable, the others as doubtful or inadmissible.

The twenty-seven thousand patients were not all exposed to two epidemics of yellow fever, but supposing only one half or one third of them to have been so, an estimate which very probably is below the truth, we should have among nine thousand persons once attacked by the yellow fever, and exposed to it again in a new epidemic, but one well authenticated instance of a second attack of that disease.

Undoubtedly, some of the minority of the commission, those particularly who voted every case to be evident, will contest the justice of this decision. And conceding to these all that it seems to me they could ask, the admission of the thirteen facts on which they were called to deliberate as cases of second attack, it would result, that among nine thousand persons who had had the yellow fever, and had been exposed to its causes in a new epidemic, thirteen only contracted it a second time.

Another objection may be made. Four physicians, who came before the commission, declared they had treated, in the last epidemic, that of 1828, some patients who had had the yellow fever in previous epidemics. These statements were not considered by the commission, the physicians who cited them, not being able to tell the symptoms of the supposed double attack : and some perhaps will say, that these were really cases of second attack. But admitting this supposition to be true, and also that each physician had seen three of these cases, in all, twelve cases of second attack, it would result, that among nine thousand persons, who had once been attacked by yellow fever, and who had been exposed a second time to the influence of all the causes of that disease, twenty-five had it twice. We must then conclude with the commission, that a first attack of yellow fever preserves from a second, as effectually, and at

least in as great a degree, as a first attack of an eruptive disease, of the small-pox for instance, preserves from a second attack of the same disease. There are cases of persons who have had the small-pox twice ; and according to a report made to the Royal Academy of Medicine, of Marseilles in 1825, of two thousand persons who had had the small-pox once, twenty, or the hundredth part, had this same disease a second time. If then, among the patients of whom we have just spoken, there had been ninety cases of second attack, the proportion of second attacks would have been the same as in the small-pox epidemic of 1825.

It will undoubtedly be said, that the report which has just been admitted, is entirely arbitrary, since the terms of it were not fixed rigorously, to which it may be answered, that if the terms of the report were fixed arbitrarily, they were so in the sense least favorable to the conclusions of the commission. But we can cite a fact more conclusive than those which precede. The French commission sent to Gibraltar, have ascertained in their investigations that of        persons who had suffered from the yellow fever in an epidemic anterior to that of the year 1828, nine only were ill in the course of this last, and admitting all these to have had a second attack, we ought to conclude that cases of second attack are rare, and adopt the opinion of the commission

which is also, as we have seen above, that of a great number of physicians, whose writings are of an earlier period. The conviction of the truth of this conclusion is so deep at Gibraltar, where there have been four epidemics of yellow fever in so short a space of time, that in the last, that of 1828, several persons exposed their children to those influences, which in their opinion would most probably bring on the disease, because at that time, it was milder and less fatal in infancy than at a later period of life. Even physicians did the same thing, and amongst others Mr. Amiel, being convinced that their children would have at that time a light attack of the disease, and that nevertheless, for the future they would be preserved from it.

We should remark also, that those who were ill only during one or two days in epidemics anterior to that of 1828, and whose symptoms were very slight, have been equally well preserved from a second attack. We cannot doubt of this preservative influence, for it has been noticed in members of a family, all of whom were ill nearly at the same time, and during an epidemic. In some of them the disease was severe and well characterized, others manifested but very slight symptoms, such as were by no means characteristic of the yellow fever.

From the facts already given, the reader can scarcely have a doubt of the preservative influence



of a first attack of yellow fever. But it may be well to add to them the two following, as very remarkable examples of this truth. The first was given to the commission by Mr. Amiel. This gentleman visited professionally, two young men of the name of Rey, during the Gibraltar epidemic of 1810. These same persons, in 1821, were on board a vessel anchored in Barcelona Bay during the yellow fever epidemic, which prevailed there. Several passengers on board the same vessel were ill, the whole ship's crew, nineteen in number, died, but the two Reys continued to enjoy perfect health. The second fact was reported by Mr. Broadfoot, and relates to civil and military domestics employed in the care of the sick during the last epidemic. The military domestics, one hundred and sixty in number, had never had the yellow fever in any anterior epidemic. The others, sixty-one in number, Spaniards or Portuguese with two exceptions, had already been its subjects. The two last, and forty of the military domestics, had the disease at different periods of the epidemic, all those, who had previously had it, escaped.

In the interminable discussions which have taken place between the contagionists and the infectionists, proofs have often been given of the non-contagious character of the yellow fever, drawn from instances of nurses retaining their health in the midst of the sick.

But in order to give such an argument any value, it must be shewn that these nurses had never had the yellow fever in an anterior epidemic, and the necessity of doing this is the greater, for, as the physicians of many of the Spanish cities, men worthy of all confidence, have assured us, it is customary to select the nurses from among those who have already had the disease.

As to the question, whether a first attack of yellow fever preserves from a second those who go from one climate to another, as from Europe to America, the facts laid before the commission by Drs. Ardevol, Cortez, Mery and Dias, are as follows:—

Dr. Ardevol knew at Havana, many Spaniards who had had the yellow fever in Spain, and who were not attacked by it in America, living there when epidemics of that disease were prevailing. The same physician had seen at Barcelona, during the last epidemic of yellow fever in that place, persons who had had the yellow fever in America, and who enjoyed uninterrupted good health. Dr. Cortez, twenty-five years a practising physician at Gibraltar, reported that of twenty-six members of the same family who had left Gibraltar to reside in Cuba, two only were attacked there by the yellow fever, and these two were the only ones who had not had it in Europe. Again, Messrs. Mery and Dias spoke of thirteen navy physicians and surgeons, who, having

had the yellow fever in Spain, went afterwards to Havana and Vera Cruz, without contracting the disease a second time, though constantly in a fleet in which it prevailed.

These facts, though few, are conclusive, and as the commission observed in their report, ought to have a great influence in the selection of troops by whom the colonies, where the yellow fever prevails habitually, are garrisoned. In this point of view Sir William Pym has rendered a great service to science and humanity, collecting as he has done, facts which shew that in an epidemic of yellow fever, the care of the patients ought, as much as possible, to be confided to those only who have had the disease at some other period, and that those, who have had the disease, may remain with safety in a city where it is prevailing epidemically, as did the inhabitants of Gibraltar.

We should remark also, that the preservative influence of a first attack of yellow fever is not destroyed after a considerable lapse of time, twenty-four years for example, since the inhabitants of Gibraltar who had had the yellow fever in 1804, were preserved from it in 1828, as effectually as those who had been attacked by it in 1815.

FOURTH PART.



TREATMENT.



## PART IV.

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### TREATMENT.

ALL the patients, whose histories we have taken, were not treated in the same manner, but our observations are so few in number, that we cannot deduce from them any certain conclusions in therapeutics. It is only by a comparison of the general results of the treatment of the soldiers, with that of the inhabitants of Gibraltar, that we can come to any conclusions to be depended upon.

The practice of the medical men of the army, differed very much from that of those of the city. The first bled largely at the commencement of the epidemic, then discontinued this practice, or at any rate, ceased to regard blood-letting as their principal therapeutic agent, and used it only as an auxiliary to purgatives and large doses of calomel. Thus, at the very commencement of the disease, or more commonly a little later, on the admission of patients to the hospital, they prescribed pills composed of



eight grains of jalap and of as much scammony and calomel, and more or less frequently in the same day, two hours even after the pills, from an ounce to an ounce and a half of castor oil, or sometimes James' powder, in a dose of two grains, with or without small doses of opium; and this, every three hours. Purgative enemata, as auxiliary to these last agents, were usually employed. These enemata were repeated the following days, and besides them, either castor oil or Glauber's salts, or Epsom salts, in the dose of about an ounce, were administered by the mouth. Instead of scammony, jalap and calomel on the first day, some army medical men used castor oil in preference, then Epsom salts, then purgative enemata, and towards the end of the epidemic, a great use was made of castor oil. At that period, some physicians were in the habit of giving enemata composed each of from ten to twelve pounds of a demulcent decoction. All, or nearly all, prescribed calomel, at the dose of from two to three grains every two hours, counting from the first or from the second day of the disease. One of these physicians, Dr. Gillkrest, employed also, and energetically, frictions with mercurial ointment. However, after the first week of the epidemic, the practice of the military medical men became the same, they all administered purgatives and calomel, regarding the latter as their sheet anchor. At this time blood-letting was used

only to combat particular symptoms, such as pains at the epigastrium, headache ; and against this last, leeches were much used. Under the same circumstances, blisters were applied to the epigastrium to prevent the recurrence of vomitings, and at the same time Riviere's anti-emetic potion was prescribed, or else, some preparation of opium.

This treatment, which the reader may perhaps be disposed to call violent, did not always produce the very uncomfortable state, which might have been expected. Notwithstanding the usual inflammatory condition of the mucous membrane of the stomach, the purgatives were by no means always vomited, and one thing is remarkable, the repeated purgatives did not produce hypercatharsis. This, undoubtedly, must be attributed to the slightness of the febrile symptoms, or to a peculiar condition of the mucous membrane of the intestines, in which its sensibility to the action of excitants was but moderate.

In the town of Gibraltar, little use was made of mercurial preparations, except in severe cases. Unprofessional persons thought they had found in olive oil an almost infallible remedy. A considerable dose of it was taken, and an enema to promote its operation, but no other remedies were employed.

In comparison with the treatment of the army surgeons, that of the Spanish physicians must be considered mild. One of these, Dr. Ardevol, at the

commencement of the disease, with the intention of dissipating the material cause, the gastric embarrassment, gave a mild purgative, as castor oil with a small quantity of gum syrup, and if, at the same period, in the first six hours of the disease, there was an obtuse pain or epigastric oppression, he prescribed an emetico-cathartic. He did not think the effects of this treatment so good when employed at a later period, and after twenty-four or thirty-six hours its action was rather injurious. In the first twenty-four hours Dr. Ardevol prescribed emollient enemata to be administered every two or three hours, or else, where the skin was hot, sea-water enemata. At the same period, he allowed no food, but advised a free use of acidulated drinks, such as lemonade, orangeade. On the second day, where there were strong symptoms of gastritis, he excited the action of the bowels by means of enemata, in which an ounce and a half of honey, and as much castor oil were ingredients. On the third day, when the patient became feeble, and, says this physician, debility was very general at that period, he prescribed a draught in which the distilled water of orange flowers and lemon peel were the principal ingredients, and later, towards the close of the disease, the debility being greater, an infusion of quinquina as a drink. In the same cases he gave wine, a spoonful every two or three hours in bouillon. He made use

of ether when the hiccough came on, but cautiously, on account of a dry hot state of the tongue, which was produced by it. When the heat was intense, he prescribed vinegar and water lotions, and had recourse to mercury in desperate cases only. He prescribed frictions with mercurial ointment, two and a half ounces a day, and if, on the third day, with a commencement of salivation, there was neither hiccough nor yellowness, the cure was certain. He did not prescribe the sulphate of quinine at any period of the disease, regarding it as a poison and an obstacle to the removal of the material cause of the disease.

Messrs. Dias and Mery, pursued a course of treatment not very different from that of the English physicians, civil as well as military. When called at the commencement of the disease, they prescribed an emetic in a large menstruum, and three hours later, a mixture of mild almond oil and of the syrup of gum, a spoonful every two hours, until an evacuation was produced. The same day, a considerable number of leeches was applied to the epigastrium. The next day, the oil was continued, and in many cases leeches were applied to the temples and to the neck, in order to diminish the headache. The third day, a mild potion of oil was prescribed, and sometimes sinapisms. The fifth or sixth day, a blister was applied to the epigastrium, and where there was considerable weakness, an

opiate was given with the extract of kino or that of valerian, and a sufficient quantity of the syrup of orange peel. The patients took a tea-spoonful of this every three hours.

The practice of the other Spanish physicians was, for the most part, like that which has just been described, or at any rate, the practice of no one resembled that of the English physicians.

Considering only the remarkable differences between the treatment of the Spanish and that of the English physicians, we ought to expect an analogous difference in the mortality of their patients. Undoubtedly, considerations of this sort induced the inhabitants of Gibraltar to declare positively in favor of the treatment of the Spanish physicians, yet, when we examine closely our facts, the superiority of this treatment is more than doubtful. It is true, that, in the army, the ratio of mortality was one in four and a half, and that, in the city, it was only one in six, so that, all other things being equal, it would seem to result from these two principal classes of facts, either that the treatment of the Spanish physicians was very efficacious, or that that of the English physicians was very injurious. But we must remember, that all the patients, treated by the military surgeons, were, with few exceptions, robust subjects, men in all the vigor of life, having attained their twenty-second year; that in the city, the male patients were, as a

class, less robust than the soldiers, and that a large part of the whole number of these patients was composed of women and children. Now we have already seen that there is reason to believe that strength and vigor of constitution are unfavorable to recovery, the ratio of mortality among children being one in seven, that of females one in five and a half, that of males one in four and a half. Then, in comparing the mortality of two classes of patients, these circumstances must be taken into the account, and when this is done in the comparison above established, the mortality of the one will become as great as that of the other, and the treatment will no longer appear to have had the efficacy which has been attributed to it.

Undoubtedly, these results will appear very singular, and for that reason, there may be some who will refuse to admit them. But science is not an affair of sentiment; we ask only what is true, and whether conclusions are rigidly deduced.

And though this result be unexpected, it is, perhaps, less surprising than at the first glance it would appear. For, the yellow fever being frequently mortal when no explanation of its fatal termination can be afforded by the condition of the organs, death must often be attributed in great part to the causes of the disease.



Nevertheless, though ignorant of these causes, and waiting for the results of experience, we may inquire what indications are to be fulfilled in the treatment of yellow fever ; first, in severe, and then in mild cases.

In severe cases, as has been said, the febrile symptoms were more or less marked at the commencement of the disease, the headache was often intense, and about twelve or fifteen hours later, there came on epigastric pains, which were soon followed by nausea and vomiting. The vomitings continued, the matter vomited was black at a certain period in fatal cases, and at the autopsies a greater or less quantity of black matter was found in the stomach and intestine, the gastric mucous membrane was inflamed in different degrees, and in all the cases observed by ourselves, there was a specific alteration of the liver. Thus, in a majority of all the fatal cases, and in many cases where the patients recovered, there was gastritis, which, however, rarely afforded an explanation of the death. In many cases, the death was unexplained by the condition of the organs ; and where such an explanation was afforded, it was found rather in the condition of all the organs than in that of any one organ in particular. These facts shew that we can hope only for a moderate success, even by the best adapted treatment, since we can direct our means against a part

of the trouble only, that which is apparent. These facts are to be borne in mind for another reason; they do not warrant the rejection of an empirical treatment, however absurd or ridiculous it may appear, since it is against an unknown cause that therapeutical agents are to be employed.

In the absence of any treatment, the utility of which has been demonstrated by experience, the following seems to me to be pointed out by a study of the symptoms and of the lesions.

General blood-letting should be had recourse to at the commencement of the disease, and the quantity of blood taken should be in proportion to the febrile symptoms. As these are generally moderate, from fifteen to sixteen ounces would be sufficient, and where the patient is very strong, or the febrile symptoms are very intense, the bleeding may be repeated. This bleeding should be made in the course of the first twenty-four hours; and although we cannot propose it as a means to prevent an inflammation of the brain, no traces of which were found at the autopsies, nor to remedy any serious mental disorder, which did not exist, still, on account of the headache, the blood had better, perhaps, be taken from the foot than from the arm.

The effects of the blood letting should be seconded by the use of cool and slightly acid drinks, such as lemonade orangeade, currant vinegar water, or a

solution of gum syrup, if the stomach bears that better than any other kind of drink, and if possible, the patients should drink from two to three pints, or even more in the course of the twenty-four hours, provided so much liquid does not excite vomiting. The intestinal canal should be evacuated by means of mild enemata, repeated two or three times in the course of the twenty-four hours, and since the gastric mucous membrane is inflamed in four fifths of the cases, and possibly is so at the commencement of the disease, or soon after, emollient fomentations may be applied to the epigastrium.

But if the vomitings should suddenly become very frequent, or the epigastric pain very severe, a general blood-letting having been made, would an application of leeches to the epigastric region be advisable? Here, we ought to distinguish the cases in which the febrile symptoms are unabated, or slightly increased, from those, where, with an increase of the epigastric pains and the vomitings, the febrile symptoms are diminished. In these last cases, we certainly ought to abstain from all evacuations of blood, and in the first cases, we might hesitate about using them; for, as in most cases the death is unexplained by the condition of the organs, it is not in consequence of an excessive inflammation of any organ that the patients die, nor can blood-letting be considered the principal remedy of the disease. And,

as facts are of more value than inductions, we must remember that at the commencement of the Gibraltar epidemic, the bleedings were large. This remedy, then, is to be employed with hesitation. Still, where a patient is very strong, and where the circumstances of his case are such as have been pointed out, we should be justified in taking eight or ten ounces more of blood from a vein, or in the application of twenty leeches to the epigastrium. This last mode of blood-letting, in my opinion, is not to be preferred to all others, since experience has not clearly demonstrated its superiority in gastritis to venesection.

One important symptom, however, demands particularly the attention of the physician, to prevent or to arrest it. I refer to the hemorrhage, and particularly to the gastro-intestinal hemorrhage, which takes place in the severe cases, and which is almost invariably a fatal symptom. And here we may find another reason for free, copious bleedings; since, in ordinary practice, blood-letting is employed at once, to prevent and to arrest hemorrhage. But, besides that blood-letting is less properly the remedy of hemorrhage than it is generally believed to be, experience has shewn that the black vomit and black stools were not less frequent at the period when the physicians bled largely, than at that when they had nearly abandoned bleeding. Repeated

and abundant bleedings cannot, then, be regarded as a means of preventing gastro-intestinal hemorrhage ; and we find other reasons for abstaining from them, in the smallness of the pulse, and the diminution of the temperature accompanying the hemorrhage. What other means, then, are to be opposed to this symptom ?

I have shewn that the black matter vomited and voided per anum, did not come entirely from the gastric mucous membrane, but that, in all probability, a part of it was exhaled by the intestinal. Then, a remedy for gastro-intestinal hemorrhage being found, it should be applied to the mucous membrane of the intestine, as well as to that of the stomach ; and as we know how frequently this last was found in a state of inflammation, and how seldom the intestinal mucous membrane was in the same condition, we should be disposed to apply our remedies to the latter, and would suggest something astringent. This appears the more rational, inasmuch as the condition of the organs with which the deposit of black matter is connected, is not inflammation, the mucous membrane of the stomach not offering any traces of it in some cases where that viscus contained a good deal of brownish or blackish liquid. It would, perhaps, be well to prescribe astringents before the appearance of the black stools,

when the temperature falls, at the end of the third, or in the course of the fourth day of the disease.

Undoubtedly writers have gone too far, and much too far, in considering the yellow fever as a hemorrhagic disease, and pointing out astringents as its true remedy. For, on the one hand, the quantity of blood lost affords an explanation of the fatal termination of the disease in but very few cases; and, on the other hand, patients die who have never had any hemorrhage at all, and this symptom is rarely met with in patients who recover. Still, it ought to arrest our attention, since, in the cases where it exists, it has more or less to do with the fatal termination of the disease.

The condition of the liver should also engage our attention; since, in all the cases, its alteration appeared to commence with the first symptoms, and perhaps many therapeutical agents might be directed against it. Unfortunately, the nature of that alteration is unknown to us, so that we cannot propose a remedy to be used against it with any chance of success. The discovery of the remedy must be left to time and chance, and to the acuteness of the observer, for experience has sufficiently proved that no dependence is to be placed on mercurial preparations of any sort.

As the frequency of an inflammatory condition of the stomach would seem to contra-indicate the use



of anti-spasmodics at all energetic, such as ether, we might try opiate preparations, which would be better adapted to the state of the stomach, and the free employment of which is permitted by the condition of the cerebral organs.

I have proposed here, merely to point out the principal indications to be fulfilled up to the period of convalescence, and as there is nothing particular in that state, so far as the treatment is concerned, I shall end by asking if some disturbing means might not be employed in the first period, when the heat is considerable, such as cold baths or cold affusions ; and if, in the second period, when the temperature is diminished, and becomes below the natural heat, a hot water or vapor bath might not be advantageously used.

As to mild cases, where the febrile symptoms are inconsiderable, and the headache moderate, cool drinks and emollient enemata appear to be the only remedies which it is advisable to employ ; the disease under this form advancing towards a favorable termination. I shall not bring the facts collected by us to the support of this proposition, and I can only say that, having been called on to take charge of two persons of rather feeble constitutions, and in the prime of life, whose febrile symptoms were inconsiderable and did not continue beyond the third day, I employed no other means than a

bath in one case, at the commencement of the disease, and a little castor oil in the other, at the commencement of the convalescence, to overcome constipation.

Although I have already said that there are no particular indications in the convalescence, I may remind the reader that the inflammation of the mucous membrane of the stomach, usually slight, and never severe in fatal cases, is still less severe, judging by symptoms, in those who recover; that the gastritis is secondary, and disappears quickly; so that it is not necessary to keep the patient a long time on a strict diet. If the weakness was prolonged, or very great, we might follow the example of the Spanish physicians, and give some slight tonics, such as bark or quinine.



FIFTH PART.

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SPORADIC CASES.



## PART V.

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### IS THE YELLOW FEVER EVER SPORADIC AT GIBRALTAR?

THE facts in which the solution of this problem is to be sought, have not been collected by ourselves; but though we may regret, on some accounts, that we did not observe them, we are much indebted to two of our professional brethren, Mr. Amiel, first surgeon of the Twelfth Regiment, and Mr. Fraser, surgeon of the Civil Hospital, who kindly communicated to us a certain number of cases from their registers, which they regarded as so many examples of sporadic yellow fever. These facts have the desirable authenticity, inasmuch as they were recorded at different periods, several of them by the predecessors of these gentlemen, and placed on the medical register, where every surgeon is required to record, with more or less detail, the symptoms of the patients whom he is called upon to treat.

These cases are forty-five in number; in nineteen, the disease terminated fatally, and in twenty-six the



patients recovered. Two of the first and five of the second, were communicated to us by Mr. Amiel; the others by Mr. Fraser. In examining them, I shall follow the same method as in my analysis of the facts of the epidemic of 1828, commencing with the anatomy.

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## ARTICLE I.

### CONDITION OF THE ORGANS IN NINETEEN FATAL CASES.

Of nineteen patients who died, eleven only were examined, all of them from three to five hours after death, and I now give the details of the autopsies.

The brain was examined in five cases, and in one\* of them its vessels were gorged with blood. The pia mater and the plexus choroides were much injected in another case.† There was a considerable quantity of serum in the lateral ventricles in one case,‡ in another,|| there was some at the base of the brain. In the history of a fifth,§ the dura mater was said to be of a deep yellow color, but nothing else was said of the condition of the brain.

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\* Benamea, November, 1825.

† Williams Delany, 12th Regiment, July, 1826.

‡ Powse, July, 1826.

|| C. Boliser, July, 1825.

§ Caldwell, May, 1825.

The stomach was examined in eleven subjects, and in six of them a certain quantity of black matter was found in it; some ounces in two cases,\* from one to two pounds in the others.† In one of these last, the matter was said to be of a dark chocolate color, but no other information about it was given. At the same time, we can hardly doubt this black matter to have been the same as that found at the autopsies of individuals, who died of the epidemic of 1828. At any rate, it must have been so in some of the cases, so that this first fact would appear favorable to the opinion of those who think that the yellow fever is sometimes sporadic at Gibraltar. But let us continue with our facts.

The gastric mucous membrane was said to be inflamed in three cases, more or less softened in two others, red and softened in a sixth, of a bright red at its cardiac and pyloric extremities in a seventh, spotted with red in an eighth, blackish and spotted with brownish red in a ninth, softened and gangrenous in a tenth. That is to say, the mucous membrane of the stomach was more or less altered in all the cases, without the possibility now of determining,

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\* Manuel Chuat, August, 1825, and Diego Morales, September, 1802.

† Diego Ansoles, August, 1826; Ponso, 1811; Gomez, Aug. 1824; Tria, August, 1811.

in the greater part of them, the nature of that alteration. For in no case was it examined under the three points of color, consistence and thickness, an examination which happily was not as essential in these cases, as an examination of the matter found in the stomach.

The condition of the intestine was given in the same cases with that of the stomach, and in six, or nearly half of them, it contained a more or less abundant black matter, like tar. This last expression was employed once only, where the stomach of the patient contained a black chocolate matter.

It has been said besides, relatively to the mucous membrane of the intestine, that it was softened in two cases, as it were gangrenous in some points in a third, of a deep red in two others, and in the last, the inflammation was gangrenous, an expression which does not give us a very exact idea.

The liver was natural in one case, where there was no black matter in the stomach nor in the intestine (Williams Delany). It was engorged with blood, softened, and of the color of the spleen in another case, where there was a great deal of chocolate colored matter in the stomach ;\* engorged in a third case, where the stomach and intestine con-

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\* Piruse, July, 1826.

tained a considerable quantity of black matter.\* In a fourth, it was more consistent than usual, without presenting other morbid conditions;† its size was increased in a fifth;‡ its color altered in four cases, yellow in one,|| greyish in the others.§ In the tenth and eleventh patients, no mention was made of the liver.

Certainly we have here a very different state of things from that observed in the epidemic of 1828, where, in all the cases submitted to our observation, the liver presented a remarkable alteration, and was uniformly the same, so that, admitting this viscus to have been correctly described in these cases of Messrs. Amiel and Fraser, we must believe that there were not more than four of them which ought to be considered sporadic cases of yellow fever, those in which the liver was yellow, or greyish, or olive. In the three last cases, the black matter was found in the intestinal canal, but there was none in the case where the liver was yellow. This by no means proves, as we have seen, that the subject did not die of yellow fever. Still, in many of the cases,

\* Boliver, July, 1823.

† S. Gabano, October, 1821.

‡ Diego Morales, September, 1802.

|| Cadwell More, 1825.

§ Diego Ansoles, August, 1826; Manuel Chuat, August, 1825; Prie, August, 1821.

we may properly entertain doubts, inasmuch as not only was the liver natural in one of these nine cases, a state not found in any of the cases observed by ourselves, but in two cases where it was altered, this alteration was different from that I have described, the liver being red, more or less engorged with blood, and enlarged, in one case called sporadic, it being more or less yellow and arid, in the other cases.

In two cases where the state of the bile in the gall-bladder was noted, it was said to be black like tar,\* or of the color of very thick coffee.† Supposing these expressions to be exact, we may remark that we have not found the bile in that condition in any of the cases of 1828.

Finally, the color of the skin having been described in eight cases, it was yellow in all of them, and in six of these subjects black matter was found in the stomach, or intestine, or in both of them.

There were, then, in certain cases, at the same time, yellowness, black matter in the stomach and intestine, and the alteration of the color of the liver. But it would seem that this alteration was not the same as that found by us in the epidemic of 1828, so that in no case was the disease iden-

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\* Boliver, July, 1823.

† Diego Morales, September, 1802.

tical with that which we have observed. At the same time, in many of the cases, where the yellowness and black matter were observed in the same subject, the course of the disease was rapid. But here even, something is wanting, in order to establish anatomically the perfect identity between several of the sporadic cases and those of the epidemic which we have observed. We are now about to see if this first view be confirmed by the history of the symptoms. Before terminating this article, I would beg the reader to remark how important are exactness and details in researches of pathological anatomy, for if in these cases the condition of the viscera had been more minutely described, the question before us might be decided much more satisfactorily.

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## ARTICLE II.

### SYMPTOMS.

Headache was noted in fifteen of the fatal cases, as existing at the commencement of the disease, or even four or five days later; at the time of the admission of the patient into the hospital. No mention was made of it in fifteen cases. In three cases it diminished the third or the fourth day of the



disease, it was severe on the sixth day in a patient who died the ninth day, having vomited a black fluid,

In twelve, or two thirds of the cases, there was delirium. In seven of them, it was observed from twelve to twenty-four hours before the fatal termination, from thirty-six to forty-eight hours before death in one case,\* and three days previously in the others.† In one case it came on between the seventh and ninth days, and here the disease proved fatal on the seventeenth day, convalescence never having appeared for an instant.‡ In six cases, the histories of which I shall give at the end of the article, there was no black vomit; no autopsy was made, so that we may well presume that there was error in the diagnosis. We must suppose this error to have existed in other cases where the delirium was more frequent and more prolonged than it was observed to have been during the epidemic of 1828. In other respects, as in the epidemic, the delirium was preceded in most of the cases, by agitation or extreme anxiety.

In two patients who died, the one on the ninth, and the other on the twenty-second day of the

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\* Williams Delany, 1826. Risso, December, 1824.

† Gomez, August, 1824. Diego Morales, September, 1802. J. Garcia, October, 1825.

‡ B. Remolins, September, 1825.

disease, there was subsultus tendinum.\* The first was not examined, but he vomited a liquid of the color of coffee, and his stools were tarry. The other had black stools, was examined, and no trace of black matter was found in the alimentary canal. For this reason, and because the disease was so slow in its progress, we cannot consider it a case of yellow fever, the expression, black stools, not indicating positively one of the most characteristic products of the yellow fever. This is more probable, because, as has been remarked, none of this black matter was found in the intestinal canal.

There was a remarkable prostration of the strength on the third day of the disease in three patients, who died the fourth, fifth and sixth days. Two of these were examined. In one of them the liver was natural, and there was no black matter, as it appeared, in the stomach or in the intestine, and the skin was not yellow.† How can we believe that this man died of yellow fever? In the other case, the liver was of an olive grey color, the skin yellow, the stomach and intestine contained a black fluid. This man‡ died on the fourth day.

The state of the eyes before the third day was

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\* Bensimot, May, 1826. J. Gonzalis, May, 1825.

† Williams Delany, twelfth regiment, July, 1826.

‡ Diego Ansoles, August, 1826.

not noted in any case, and the injection, which was remarked at the commencement of the disease in all the cases of the epidemic, is spoken of here in three only, and then on the day before that, on which death took place. It was observed on the ninth and last day of the disease in two cases; from fifty to seventy-two hours before the fatal termination in a third.

No mention was made of the yellow color of the eyes in five cases. In the others this color was noted once or oftener, from the third to the seventh days, even in patients who died on the twenty-second.

The state of the pulse was noted in some particulars in fifteen patients; and in nine or three-fifths of these, it was said to have been intermittent the day of, or the day before the death, usually at an earlier period; in some patients on the ninth day of the disease. One of these, who died on the seventeenth day, vomited no black matter, but his stools were of a tar color. This expression, as has been said, was employed to denote the color of the bile, and consequently, does not express the characteristic color of the fœcal matter in yellow fever.

No autopsy was made in this case.

The frequency of the pulse was not very great, except the day of, or the day before, the death. In the first days of the disease, in those cases where it

was counted, its beats were not more than from eighty to ninety in a minute. Its fulness at the commencement was not noted in any case.

Chills at the commencement of the disease were noted in six cases. In the others no mention was made of them.

In one case the skin was dry, and in the other cases it was only noted that the fever was more or less considerable. A diminution of the temperature was noted in three cases, two of which relate to patients who died after a disease of eight and nine days, and in whose intestinal canals we found some black matter.\* In the other case, there was no black matter in that canal, nor was there any disease of the liver, nor any yellowness.† And if there was really no diminution of the temperature in the other cases, the reader must come to the same conclusion here, as after the examination of other symptoms, viz. either there was great error of diagnosis in the cases which have been communicated to us as sporadic cases of yellow fever, or the symptoms of this disease, when developed under these circumstances, differ greatly from those it presents when it is epidemic.

Swelts have not been noted in any case.

In fifteen cases, where the color of the skin was

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\* Boliver, July, 1823. J. Garcia, October, 1825.

† Williams Delany.

mentioned, it was yellow ; as early as the third day in two patients ; on the fourth day, in four ; and on the ninth day, in three ; two of whom died after an illness of twelve and twenty-two days. An autopsy was made in both these cases, and a black fluid was found in the intestinal canal of that one only who died on the twelfth day.\* The yellowness commenced the seventh day in three other cases ; the ninth and eleventh, or the day of the death, in the two last.

The skin having been found yellow in all the cases where its color has been noted, even in those who died of a very different disease from the yellow fever ; it results that the yellowness coming on in a patient suffering under an acute disease in warm climates where the yellow fever has been epidemic, is worth much less as a diagnostic symptom, than we should at first be disposed to believe ; it being well understood that in this remark, I make no reference to hepatitis.

The tongue was of a blackish brown, and usually dry from three to six days before the fatal termination, in ten, or a little more than half the cases, and we must agree that this appearance is different from that observed by us in the epidemic of 1823. The tongue was dry during the whole

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\* J. Gomez, August, 1824. Manuel Chuat, May, 1825.

course of the disease, or five days and a half, in one patient whose liver was natural, and in whose intestinal canal no black fluid was found.\* It was in the same state in a twelfth patient, who died after an illness of four days.† In the other cases it has been said merely that it was dry and coated at the time of the examination, four days and more after the commencement of the disease. In no case was it the seat of hemorrhage.

There was an exhalation of a certain quantity of blood from the gums and other parts of the mouth, in a patient who died from the twelfth to the thirteenth day. In another case, they were said to have bled on the last day of life, and on the seventh of the disease.

The epigastrium was more or less painful, on or without pressure, in thirteen patients, four and five days before death in twelve cases, a little later in the others. I do not know at what period this pain came on; the patients having entered the hospital some days after the commencement of the disease, and the previous condition of the epigastrium not having been noted.

In eighteen cases, vomitings were noted, and seventeen of these patients died. In ten of them, the fluid vomited was black during the last three

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\* Williams Delany.

† Diego Ansoles.



days of life. This proportion is less than that which we have pointed out as true of the cases observed by us in the epidemic of 1828.

The stools were black or tarry, or of the color of mushroom sauce, in seventeen cases, and this at a period more or less distant from the fatal termination.

Thus, examining the symptoms observed in these nineteen cases, or the lesions found after death, we see clearly that the diagnosis has often been erroneous, that many cases considered as examples of sporadic yellow fever do not belong to that disease, and that on the other hand, it would be difficult not to recognise that disease in some of the cases.

This twofold conclusion will become more evident in placing before the reader some of these facts, beginning with those where the diagnosis of our professional brethren seems to have been correct.

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#### FIRST OBSERVATION.

DIEGO ANSOLES, æt. 70, was admitted into the Civil Hospital of Gibraltar, the 18th of August, 1826, in Mr. Fraser's division. He had been at work in the southern gardens, and for two weeks he had not left the territory of Gibraltar. His illness was already of two day's standing. He complained

of great prostration ; his epigastrium was tender on pressure ; his tongue dry ; he vomited a black fluid ; his stools resembled tar ; his pulse was intermittent, and the fever not quite so high as at the commencement. The morning of the 19th, the black vomit was copious, there was a suppression of urine and hiccough. *Subsultus tendinum* was observed on the 20th, and the same day the patient died. At the autopsy, which was made four hours after death, the skin and the adipose cellular tissue were of a saffron yellow color ; the stomach increased in size, containing about a pound of a black fluid ; its mucous membrane of a rose color, pulpy, less coherent than natural ; the small intestine in the same condition ; the liver of an olive grey color. The head was not examined.

Although we must regret the absence of many details which would have greatly increased the interest of this observation, in rendering our conviction more complete, still we find here most of the symptoms, and most of the lesions, which may be considered characteristic of the yellow fever. The black vomit, the tar-like stools, the yellowness, the inflammation of the mucous membrane of the stomach, a considerable quantity of black matter in this viscus and in the small intestine, a peculiar alteration of the liver. This lesion has been mentioned rather than described,

and though the terms made use of for this purpose denote rather a different lesion from that which we have observed ourselves in the epidemic of 1828; the presence of yellowness, of black vomit and black stools in a disease so rapidly fatal, for this last consideration is very important, will not allow us to doubt of the character of the disease, nor of its identity with that which prevailed epidemically in Gibraltar in 1828.

We must regret again, that the number of years, during which the patient had been at Gibraltar was not noted, and whether he had been there during a previous epidemic; the condition of his eyes, the state of the temperature during the last twenty-four hours, that of the thoracic viscera, that of the mucous membrane of the small intestine and of the mesentery, the size of the liver, whether it was dry or moist, its cohesion, its interior aspect; we must regret that we have not information on all these points. And I do not make this remark merely to criticise observations, which we must consider ourselves very fortunate to be able to cite, and which do honor to the zeal and to the ability of those who collected them, but to shew again, and on an occasion where it seems to me my duty to do so, the care and the time necessary to observation, where the facts are to satisfy cautious minds. And I would also urge upon my readers, that they ought to neglect no

detail in their descriptions, whether they are giving an account of symptoms, or of lesions.

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## SECOND OBSERVATION.\*

An Englishman, by the name of BRUCE, æt. 30, a short time only at Gibraltar, was admitted to the Civil Hospital, August 25th, 1821. His illness commenced with chills and other febrile symptoms, and upon his admission, on the third day of the disease, his skin and eyes were yellow; the skin dry and hot; the pulse rather strong than feeble; the tongue covered by a whitish mucus; continual vomitings; sensation of weight at the epigastrium.

The 26th, the countenance was more natural, the skin cooler, moist, the pulse not so strong, the vomitings less frequent, several black stools, an apparent amelioration. The vomitings became more frequent during the night, and on the morning of the 27th, they were almost continual, of a lead grey color, approaching to black. He could not endure the slightest pressure on the epigastrium, the edges of the tongue were dry and red, its central part black,

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\* It was taken by Mr. Wilson, assistant surgeon of the Civil Hospital of Gibraltar.

the heat moderate, the forehead covered with a clammy sweat, the pulse feeble and intermittent.

In the afternoon, the vomitings were black, but less frequent; the stools were of the same color; hiccough. The delirium was constant during the night; the morning of the 23th, the respiration was laborious, coma, and death at eleven o'clock.

The autopsy was made five hours after death. Two pounds of black matter were found in the stomach, the mucous membrane of this viscus was softened, and scattered over it were spots of blood. The intestines were filled with gas and with black matter; the internal coat of the colon was injected, and some traces of erosion were noted; the liver was of a grey color, and firmer than usual.

The remarks made after the first observation might be repeated here; but I will only remind the reader, that here too the progress of the disease was rapid; that in the course of it were observed yellowness, epigastric pains, vomitings not remarkable at first, but subsequently black, and the stools of the same color; that at the autopsy there was found a large quantity of black matter in the stomach and intestines; the liver was altered, greyish, its density increased, and although the color of that organ was not such as we found it in the epidemic of 1828, it seems to me hardly possible to refuse to admit this case to have been one of sporadic yellow fever.

This conclusion is the more reasonable, since the too succinct description of the liver leaves some doubts as to its accuracy.

In the following observation, the patient died after an illness of nine days. It was taken by Mr. Borthers.

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## THIRD OBSERVATION.

JOHN YABANO, æt. 40, had been ill three days when he was received at the Civil Hospital of Gibraltar, on the 15th of October, 1825. He dwelt on the neutral ground, in a miserable hut made from a boat. Before his admission, he had been troubled with nausea and had vomited. The vomitings continued, the epigastrium was the seat of a burning heat, the tongue was coated, the stools soft, the pulse ninety-eight, the temperature of the body natural, or rather below the healthy standard. (The skin was said to be cold.) The skin and sclerotic were yellow.

From that time until the morning of the 21st, the day of the death, it was observed as follows. The vomitings continued during the 16th, but were not renewed the following days, the stools were black and bloody the 16th, very black the 20th. The tongue was moist, its edges red, its central part



brown the 17th ; dry, and, as it were, burnt, the 20th. The epigastric pains were diminished the 17th ; the 19th, the epigastrium was painful on pressure ; the 18th, the urine was suppressed, it was passed in small quantities the 19th ; the pulse was ninety-four the 16th ; the yellowness more marked the 18th, than on the preceding day. There were pains in the chest at the same period, but not afterward.

At the autopsy, made five hours after death, the yellowness was very marked, the brain and the thoracic viscera were natural ; about a pound of black matter was found in the stomach ; the mucous membrane of this viscus was softened, near the cardiac and pyloric orifices and along the great curvature were several ecchymoses ; the intestines were filled with gas and a black fluid ; the liver harder than usual, its color not mentioned ; the kidneys larger than natural.

Excepting the slower progress of the disease, there is the greatest resemblance between this case and the preceding. The symptoms and the lesions were the same, so that we must almost necessarily consider it a new example of sporadic yellow fever. We must regret here, that the description of the liver is so imperfect. We are told only that its firmness was greater than usual, and this, perhaps, points out satisfactorily that it was not the seat of inflammation ; at any rate, not of acute inflamma-

tion. As the color of it has not been described, some persons may be disposed to believe that it was natural. But this conclusion would be far from being correct. The omission shews merely that the attention of observers had not been sufficiently drawn to the condition of the liver in yellow fever, and that no autopsy is complete, or can be the source of solid instruction, where all the organs have not been examined with equal care, and described with sufficient details.

I might give here others of the facts already analysed as real or presumed cases of sporadic yellow fever. But since the existence of such cases would not be better proved by six than by three cases, and as their existence is all that concerns us, I shall stop here, and I shall end with one of the cases, where, as it seems to me, there was an error in the diagnosis.

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## FOURTH OBSERVATION.

B. ANNOLINO, a Spaniard. æt. 48, came to the Civil Hospital of Gibraltar the 11th of September, 1825, and said he had been ill three days. He had been a long time an inhabitant of Catalona Bay, and had been seized with chills followed by violent

heat, an intense temporal and frontal headache, nausea and vomitings.

When he arrived at the Hospital, the headache was dull; there was pain in the back; the edges of the tongue were red, its central part brown; uncomfortable feeling at the epigastrium; nausea; vomitings spontaneous, or excited by pressure in the epigastric region; the hearing obtuse, the eyes injected, slight yellowness of the neck.

The next day, the 12th, the vomitings continued, the urine retained.

The 13th, the eyes dull, the conjunctiva yellow; universal yellowness.

The 14th, the vomitings less violent; the stools of the color of tar, the pulse intermittent; a small quantity of urine was drawn off by the catheter. The patient became delirious during the night, and the 15th, he was in despair, refused to take medicine, his eyes injected.

The 16th, the delirium and the retention of urine continued; the pulse intermittent. The 17th, the tongue black, the patient appeared moribund, was insensible, his respiration was laborious, he slipped to the foot of the bed.

The 19th, there was a slight amelioration, the sensibility returned, a boil was discovered over the right malar bone. The febrile symptoms were diminished the 20th; the gums appeared to be

affected by the mercury, the boil increased in size ; it extended nearly over the whole face the 25th, it became erythematous ; the next day, it was enormously swollen, as also the neck ; the patient was delirious, and died at five o'clock in the evening.

No autopsy was made.

It seems to me that this cannot be considered a sporadic case of yellow fever, and for several reasons. The patient, it is true, was yellow, the vomit and the stools were like tar, but this last expression has not the same meaning as black, and, as I have remarked, it was employed in several of the cases to denote the color of the bile, which was not found to be black in any of the patients who died of the epidemic disease of 1828, and whom we examined. Yellowness and vomiting are observed in many acute diseases, which are neither yellow fever nor diseases of the liver. Again, the course of the disease was slow, instead of suppression of urine, a symptom noted in some cases during the epidemic, retention was observed. The sensibility was lost for a short period, and at one time the tongue was black. The progress of these symptoms belong rather to typhoid than to yellow fever, so that it is impossible to receive this case as an example of sporadic yellow fever.

The following observation is rather more clearly an instance of a false diagnosis.

## FIFTH OBSERVATION.

A soldier of the twelfth regiment, WILLIAMS DELANY, of a strong constitution, plethoric, usually in good health, was admitted to the Marine Hospital the 10th of July, 1826, having been ill but a short time. He complained of headache, universal pains; his skin was dry and hot; his pulse frequent and full; his tongue dry.

Venesection  $\frac{3}{4}$  xx, purgative pills two hours afterwards, and an ounce of the sulphate of magnesia.

The stools were numerous; the tongue covered by an inflammatory coat, and on the 11th, there was headache; anxiety; restlessness; a frequent, strong, and resisting pulse; the skin hot and dry; the thirst intense; the tongue coated; the respiration free.

Venesection  $\frac{3}{4}$  xxvj; three grains of calomel and antimony every three hours; barley water.

The patient died the 15th, at eleven o'clock in the morning, and his condition up to that day was as follows. The tongue was moist the 12th and 13th, dry and thick the 14th, black the 15th. No vomitings were noted, nor even the slightest epigastric pains. The stools were involuntary the 14th and 15th, there was a great deal of restlessness and anxiety the 13th; delirium the 14th; and prostration

on the evening of the same day. The pulse was frequent the 13th; at one hundred and two the morning of the 14th; the skin was cool the 13th, and hot the next day; its color was not noted.

On the 12th, pills of antimony and calomel were prescribed, as on the preceding day. On the 13th, a blister was applied to the neck, ten grains of calomel were ordered to be taken every four hours, a hot bath in the evening, pills of calomel and alum. The evening of the 14th, a drachm of laudanum was administered in four ounces of menstruum. Repeated doses of red wine, and lotions of cold water to the head, were ordered.

At the autopsy, the pia mater and the plexus choroïdes were much injected; some drops of serum were found in the lateral ventricles; the stomach was empty; its mucous membrane universally inflamed; and black or red patches were observed on it. A black sediment and froth were found in the small intestine; the liver was natural.

#### SEC. II.—PATIENTS WHO RECOVERED.

In twenty-one of the twenty-six cases, the existence of headache was inquired into. It was found in all; in half of the cases it was intense during a space of time varying from two to four days, the mean duration of the disease being eight days and



two thirds, or nearly that of similar cases during the epidemic of 1828.

Of eleven patients, in whom the state of the mind was noted, eight were delirious, either towards the middle period of the disease ; or, and this was more frequent, towards its termination, for a short time only, usually in the night, and never for a longer period than twenty-four hours, except in one case, where the disease lasted fifteen days, and where the delirium existed between the fifth and seventh days. The frequency of delirium and the duration of the disease in this case, would lead one to think that there was error of diagnosis in some of these cases.

Pains in the back, loins and limbs, were found in all the cases where inquiry was made respecting them, sometimes very violent, and coming on at the commencement of the disease.

An extreme prostration during twenty-four hours at a certain period of the disease, was observed in three cases, and during five and seven days in two others, where the disease lasted from twelve to eighteen days.\* The duration of the prostration, and that of the disease, would seem to shew that there was error of diagnosis in the three last cases.

The eyes were injected in a third part of the cases,

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\* Joseph Beherona, Sept. 1823 ; Bolbart, May, 1826.

and in almost all these subjects, on the first or second day ; as early as the second day in one of those cases to which we have just referred, and where the disease, on account of the prostration and its duration, cannot be considered sporadic yellow fever.\*

The pulse was not remarkable, except in one case, to which we have already referred, and where it beat from one hundred and ten, to one hundred and twenty times in a minute, during the first eight days. This frequency was not observed in any of the cases collected by ourselves during the epidemic of 1828, and this is another reason why we should not receive that case as an instance of sporadic yellow fever.†

Chills took place the first day in these cases. The temperature was so briefly noted, that we cannot give a general account of it. Sweats were mentioned in four cases.

The skin was yellow in twenty patients; in a much greater proportion than during the last epidemic, which seems to confirm all that has been said of the secondary importance of yellowness as a diagnostic symptom of yellow fever, for among the patients whom we are now considering, several of them did not have the yellow fever.

The state of the epigastrium was mentioned in

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\* Rosbut, May, 1806.

† J. Beherana.

eighteen patients, all of whom experienced more or less severe pain in that region, and one of them suffered, as early as the commencement of the disease, from a pain which continued to increase during three days. In the other cases it was not severe.

The vomitings took place in all the cases but two, in whose histories no mention of them was made. They commenced on the first day of the disease in six cases, at a later period in the others. In one case only, where the convalescence commenced the ninth day, the vomit was black, like coffee grounds, on the fourth day, and on the fifth, it was only of a dark color. In several cases the patients vomited during two or three successive days, and in some cases the vomitings were excited by drinks, in others by medicines.

The stools were black in all the cases at the time when mention of them was made, from the fourth to the ninth day, and this, whether they were liquid or solid. It is difficult to know exactly what is meant by the expression black stools, for the most respectable authors have used it to denote the color of the stools in the most different diseases, and no attempt was made to ascertain if this color was owing to blood or to some other cause; so, that but a moderate importance is to be attached to the stools in as far as diagnosis is concerned.

Thus, whether we consider merely the duration

of the disease. or the extreme prostration which existed during a considerable space of time in some cases, or the difficulty of knowing exactly what is meant by the word black, as employed to designate the color of the stools in many patients, or the fact that yellowness is by no means a characteristic symptom of yellow fever, we must admit that many of the cases that have just been analysed are not sporadic cases of that disease.

The following observation appears to me to be an example of a sporadic case of that disease. It was communicated to us by Mr. Amiel, and was taken from the answers made by that gentleman to the English medical commission, which met after the epidemic of 1814.

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SIXTH OBSERVATION.

DOMINIQUE BENEDITI, a Spaniard, of a strong constitution, plethoric, æt. 26, was admitted to the Regimental Hospital of Gibraltar, the 29th of August, 1812. His illness began the same day at two o'clock in the afternoon, at the land gate, where he was employed making a pump to facilitate the operations of some laborers who were at work at that point. At the commencement, he experienced

violent chills and an intense headache, and on his arrival in the hospital, he complained of uncomfortable feelings, he was anxious ; he vomited a green fluid ; the pulse was frequent ; the skin hot and dry ; the eyes red and injected ; the arms and joints were painful.

The patient was very uncomfortable during the night and did not sleep ; the 30th, his countenance was sad ; he had nausea, and vomited and sighed continually.

The 1st of September, he could not remain quiet in any posture ; constant nausea, his drinks vomited as soon as taken ; his eyes yellow ; the abdominal muscles contracted ; no epigastric pain. During the following night he became delirious, and the morning of the 2d, his mind was clear ; he was drowsy ; constantly nauseated, and even vomited a considerable quantity of a black fluid, like coffee grounds. The temperature of the body was natural.

During a part of the night there were hiccough and vomitings of a dark color. The next morning, the hiccough returned at intervals ; the urine was of a deep color ; the skin yellow. The 4th, the yellowness was still more marked, the hiccough did not return ; the patient had several black stools, and vomited once.

The 5th, he was much better, the hiccough and the vomitings did not re-appear ; the pulse was soft

and regular ; the epigastrium indolent ; the gums tense ; the tongue somewhat swollen. He slept several hours the following night, the amelioration continued the 6th, on which day the patient took with pleasure some bouillon with sago.

The 7th, the convalescence was confirmed.

Dominique Benediti took mercury and purgatives. His medical attendants, Mr. Amiel, and Dr. Gilpin at that time inspector of the Gibraltar hospital, did not think proper to bleed him, so that he was treated nearly in the same way as the soldiers during the epidemic of 1828 and after its first period.

Thus, at the commencement of the disease, there were chills, headache, and soon after, uncomfortable feelings, anxiety, vomitings, heat and redness of the eyes. These symptoms continued during three days with more or less intensity. At the commencement of the fourth day, the matter vomited resembled coffee grounds ; the next day, there was hic-cough, the skin was yellow, and the convalescence was confirmed after an illness of less than eight days.

These symptoms, in their nature, violence and duration, resemble those observed in the severest cases of common yellow fever, so that it seems to me impossible not to see here a sporadic case of that disease.

Thus then, whether we study fatal cases, or those where the patient recovered, we must allow,



several among them to be instances of yellow fever, so that this disease would seem to exist at Gibraltar sporadically. But, this conclusion being admitted as correct, the question of the mode in which yellow fever is communicated would not be settled, its non-contagiousness would not follow. For we see every day the most incontestably contagious diseases, as, for example, the small-pox, under sporadic forms, and appearing only at distant intervals of time. All, then, that we can conclude, the existence of sporadic cases of yellow fever being admitted, is, that this fever may be developed at Gibraltar, independently of any thing coming from America. To conclude absolutely that the yellow fever is not contagious, would be to go beyond our facts, and if this conclusion be the expression of the truth, it can result only from another class of facts.

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